Medical Library

BRITISH MEDICAL JOURNAL

DEC 26 1941

JOURNAL OF THE BRITISH MEDICAL ASSOCIATION

SATURDAY DECEMBER 6 1941

PRINCIPAL CONTENTS

Effects of Cold upon the Skin .. .. p. 795
Value of Stored Blood: Failure of In Vitro Tests .. 797
"Wound Phagedaena" .. 801
Enuresis in Adolescents .. 803
Combined Intra- and Extra-uterine Pregnancy 805
Reticulocytosis in Untreated Pernicious Anaemia 806
Leading Articles .. .. p. 811
Correspondence 821
Louse-borne Typhus Fever .. 817
Hermaphroditism: Historical Approach 818
Impressions of a Regimental Medical Officer 816
Reviews 808
Medical Memoranda 807

WITH SUPPLEMENT

LONDON
BRITISH MEDICAL ASSOCIATION
TAVISTOCK SQUARE

No. 4222, WEEKLY, PRICE 1/3

Copyright

REGISTERED AS A NEWSPAPER

Whooping Cough

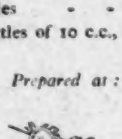
There is a substantial and increasing body of evidence to support the use of properly prepared vaccine for the prophylaxis of Whooping Cough.
Recent work suggests that four spaced doses of 0.5 c.c. (5,000 million organisms), Whooping Cough Vaccine will produce a useful degree of immunity. Some clinicians prefer to inject 70,000 million organisms in divided doses at weekly intervals.
Whichever scheme of dosage is favoured, 'Wellcome' Whooping Cough Vaccine fulfils the conditions which appear to be essential for successful immunisation.

'WELLCOME' WHOOPING COUGH VACCINE *Hæmophilus pertussis* (Bordet-Gengou bacillus) smooth virulent Phase I. 10,000 million organisms per c.c.

Set of four ampoules - - 5/-
Rubber-capped bottles of 10 c.c., 10/3

London Prices subject to the Medical discount.

Prepared at: THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES



Supplied by:
BURROUGHS WELLCOME & CO.
(THE WELLCOME FOUNDATION LTD.) **LONDON**

ASSOCIATED HOUSES: NEW YORK · MONTREAL SYDNEY · CAPE TOWN · BOMBAY · SHANGHAI · BUENOS AIRES.

ADSORBENT OF ALIMENTARY TOXINS

CARBACT

BRAND

ACTIVATED CHARCOAL TABLETS

FORMULA:

Activated Charcoal	3 grains
Bismuth Tribromphenate	1⅛ grains
Ext. Rhei Sicc.	⅛ grain
Excipient q.s. to	7½ grains

INDICATIONS:

All conditions due to alimentary intoxication, whether bacterial or chemical
Severe gastro-intestinal disturbances
Flatulent dyspepsia
Intestinal distension
Poisoning arising from food, vegetable and inorganic poisons
Gastro-enteritis
Diarrhœa and dysentery

AVAILABLE IN PACKETS OF 100 TABLETS

RAPID BLOOD REGENERATION

FERRAEMIA

BRAND TABLETS

FOR ANÆMIA

FORMULA:

Ferrous Sulph. Exsicc.	2¾ grains
Dried Yeast	2 grains
Copper Sulphate	1/100 grain
Manganese Hypophos.	1/32 grain
Excipient	⅛ grain
Chocolate coating q.s. to	8½ grains

INDICATIONS:

Hæmorrhagic Anæmia, Acute and Chronic
Anæmia of Pregnancy
Nutritional Anæmia
Idiopathic Hypochromic Anæmia
As a tonic during convalescence and debilitated conditions

AVAILABLE IN BOTTLES OF 60 TABLETS

Manufactured in England by
WILCOX, JOZEAU & CO. LTD.,
74-77, White Lion Street, London, N.1, and at 19, Temple Bar, Dublin

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 6 1941

OBSERVATIONS ON SOME NORMAL AND INJURIOUS EFFECTS OF COLD UPON THE SKIN AND UNDERLYING TISSUES

I. REACTIONS TO COLD, AND INJURY OF NORMAL SKIN*

BY

SIR THOMAS LEWIS, M.D., F.R.C.P., F.R.S.

Physician to University College Hospital

The need to understand the reactions of the human skin and underlying tissues to cold increases with time. Men ascend to greater heights on mountain and in air; they go down to work deeper beneath the surface of the sea; and in these ascents and descents they become more exposed to the influence of cold. They work in the artificial coldness of storage chambers. And in wartime many are exposed to the cold of wet trenches or to the icy waters of the sea for long periods. Women, for their part, reduce to vanishing-point the clothing which long experience has taught us it is wise to wear on the limbs in wintry weather. It is my purpose in these lectures briefly to review work relevant to the injurious effects of cold, work that has occupied the attention of my co-workers and myself from time to time for a number of years.

Cooling and its Effects on Blood Flow to the Skin

If a person who is comfortably warm—that is to say, with skin temperature everywhere within a few degrees of blood heat—enters and sits at rest in a cold room the temperature of the skin begins to fall. In the absence of an obvious source of radiant heat, a room temperature of 16° C. (61° F.) will cause progressive cooling in most people; in many it will take place at 18° C. (64° F.); in some it will occur at 20° C. (68° F.). This progressive cooling is shown chiefly by certain parts of the body, where it will continue until the temperature approaches that of the surrounding air. Parts of the body so affected are those presenting a surface that is large in relation to their mass. The extremities of the limbs, and especially the digits, cool fastest and most. Of the face, the ears and nose cool most rapidly, for they, too, have relatively large surfaces; but they do not cool as fast or as far as the digits (Lewis, 1931). The rate and degree of cooling are usually displayed in the order: fingers (and toes), ears, and nose. These are the only parts of the body in which cooling is usually profound in the circumstances described, and fingers and toes are the only parts in which cooling often occurs down nearly to room temperature. Such cooling takes half an hour or more. The presence of clothing naturally influences the result, especially if the air of the room is in motion, for clothing holds a layer of warmer air on the skin's surface. Out of doors in a cold wind, if the subject is walking, the feet will be kept warm by the friction and by increased blood flow to the working muscles of the limb. The fingers and ears in such conditions will cool most, and the fingers more than the ears if the former are uncovered. There will be variations, according to the precise circumstances of exposure and from subject to subject. Immersion in water brings the skin near to the temperature of its surroundings in a very few minutes, and much faster than exposure to cold air, though again more rapidly and more completely in parts that, like the digits, have large surfaces.

Effect on Blood Flow.—When the body surface is exposed to cold the vessels of the skin normally contract, blood flow is reduced, and heat loss from the skin is diminished. This vasoconstriction is a complex response; indeed, it comprises three separate reactions. First, there is a direct and persistent response of the superficial vessels to cold; they contract locally. Secondly, cold when applied to any part of the skin causes an immediate general vasoconstriction by reflex action through the central nervous system. This reflex, however, is only transient. It is succeeded and replaced by the third response. Cold venous blood returning from the cooled skin joins and lowers the temperature of the blood in the general circulation. This blood travels to, and acts upon, a central nervous mechanism, which is very sensitive to cold and responds by calling forth a general vasoconstriction, which is persistent. The second reaction is easily displayed; for if a limb is cooled while the circulation to it is cut off there is an immediate and transient general vasoconstriction; but the third reaction takes place only when the circulation to the cooled limb is restored (Pickering, 1932). In these vasoconstrictions, whether brought about locally or generally, all surface vessels—arteries, arterioles, capillaries, venules, and veins—participate.

All blood passing through the capillaries of the skin must come to the surface and enter the dense networks of the subpapillary venule plexuses, the blood in which gives colour to the skin. These plexuses act as efficient radiators when blood flows rapidly through them. There is, too, in certain parts of the skin an additional apparatus for heat dispersal—namely, the arteriolo-venous anastomoses, which, situated mainly at the very extremities of the limbs or digits, are able to convey a torrent of blood close to the surface. These additional radiators also respond to cold both directly, and indirectly through the nervous system, and so by closing form part of the mechanism of heat conservation (Grant, 1930; Grant and Bland, 1931; Grant and Pearson, 1938). Briefly, the skin is a most important organ in the regulation of body temperature; for, while it can rapidly dissipate heat when the body should be rid of it, it can conserve heat when the body should retain it.

The complex mechanism here briefly described constitutes a general defence of the body against cold; but, in thus acting, those parts which contain the radiators are

* The first of three Holme lectures delivered at University College Hospital. Lectures II and III will appear in our next two issues.

sacrificed. For a closing-down of the limb vessels, while safeguarding against excessive fall of body temperature, simultaneously ensures a fall of limb temperature. Moreover, the cooling of the limb, with its contained vessels, brings as it proceeds a greater closure of these same vessels in its train. Thus, locally, a vicious circle is established, which gradually carries the temperature of the limb closer and closer to that of its surroundings.

A fall of temperature to 10° C. (50° F.) or lower always benumbs the skin after a time, so that fine touch sense, and ultimately all touch and pain sense, is lost; it weakens the muscles of the limbs, and particularly those of the hand, by cooling them and their motor nerves; it no doubt interferes with the local proprioceptor mechanism and with fine control of movement, which depends on this. Thus the limb, and especially its extremity, in virtue of its sacrifice becomes a relatively inefficient member. But the sacrifice does not end here; there is abundant evidence, presently to be reviewed, that cooling beyond certain points injures the skin. The skin possesses its own local mechanism, which to a point meets this danger.

The Skin's Local Defence

If a finger is dipped into and held in a mixture of ice and water its surface temperature rapidly falls until it is not far above freezing-point; the deep parts of the skin cool almost as much, and the whole process occupies but a few minutes. When the finger is thus robbed of its natural heat it becomes the seat of pain, and this continues as long as the finger is maintained in its cold surroundings. But in five to twenty minutes the pain lessens; the finger feels comfortable, it no longer feels even cold, and observation shows that its temperature is rising. It becomes the seat of a local vasodilatation (Lewis, 1930). This vasodilatation is short-lived, but while it lasts it is intense enough to raise the temperature of the still-immersed finger 5° C. (9° F.) or even as much as 8° C. (14° F.); and it is sufficiently intense to bring the temperature of the cooled finger—if this is withdrawn from the water—well above that of the uncooled fingers of the same hand. This response of the cooled finger does not persist; for vasodilatation, with its warmth, is succeeded by a swing back towards a more usual vascular tone, and at once the temperature of the immersed finger begins to fall again and, cooling sufficiently, the whole process is repeated. Thus the temperature of the immersed finger rises and falls periodically; but as a result its mean temperature is very appreciably raised.

This vascular response of the skin happens not only when digits (fingers or toes) are immersed but when skin of the face, notably that of the ears, chin, and nose, is cooled excessively either by immersion in cold water or by exposure in cold air or wind (Lewis, 1930, 1931). It is a response which is far less in evidence in the skin of the rest of the body. It depends upon a local or axon reflex, for it does not occur in fingers the cutaneous nerves of which have degenerated; it is lost six to ten days after such nerves are cut—namely, at the time at which degeneration happens (Lewis, 1930; Lewis and Pickering, 1936). It returns when these nerves regenerate. The persistent coldness of fingers which have lost their nerve supply is in large part due to the absence of this reflex; and persistent coldness is thought to be responsible for much of the pathological change which is apt to occur in such fingers (Lewis, 1930; Lewis and Pickering, 1936).

The defensive reaction of the skin described is vigorous when cooling proceeds near to the freezing-point of water; but careful observation shows that it begins to be recognizable at temperatures as high as 15° C. (59° F.) or occasionally even 18° C. (64° F.). Thus it happens at temperatures which skin of digits often experiences out of doors during winter months in this country; and the reaction has been shown actually to occur in such circumstances. It is very notable in the hands after snow has been much handled. The response undoubtedly constitutes an important defence against cold, though it will be understood that the defence is incomplete. It appears when cold begins to produce effects on the skin which independent evidence suggests may result from injury. The defensive response to excessive cooling which we are discussing is almost certainly an actual reaction to injury, and related in its degree to the extent of injury.

Evidence that Cold Injures Normal Skin

It is important fully to realize that cold affects the normal skin in two distinct ways. It may damage the skin by direct action or by causing it to freeze. These two effects have often been confused; both have often been described under the term "frost-bite." To avoid such confusion I shall limit that term strictly to effects which follow freezing of the skin, and shall defer consideration of this subject until later. Here I propose first to discuss experimental evidence that normal skin can be injured by reduction of its temperature and without the intervention of a mechanical injury to the cells such as inevitably happens when ice crystals form in the skin. The evidence in question is derived from a number of different sources.

Axon Reflex.—It has been stated already that the skin reacts when cooled to low temperatures. It reacts by producing a local vasodilatation through a local or axon reflex. Now, this reflex is known to be called into play in a large number of other skin reactions: these involve injury of the skin, such as cutting, pricking, burning, freezing, etc., all of which are believed to release histamine-like substance or substances from the skin cells; or the reaction occurs when extracts of skin, or histamine itself, is introduced into the skin. The appearance of a similar vasodilatation on cooling the skin may not be conclusive, but it is suggestive evidence of H-substance release, and to this extent supports the idea of injury (Lewis, 1930).

Local Pain and Tenderness.—Experience would seem to show that in general the production of pain in skin involves damage to the skin. Thus, if heat is applied to skin the earliest evidence of injury, as displayed by vascular reactions, appears at about 42° C. (Lewis and Love, 1926) or very close to the lowest temperature at which the sense of warmth is replaced or supplemented by sense of pain; this temperature is approximately 43° C. (109° F.). Similarly, cold objects give a pure sense of coldness, until as the testing temperature is lowered an element of "sting" or pain is introduced. This new element in the sensory response begins to be detectable very close to the point at which an application of cold to the skin brings the axon reflex response just described—namely, about 15° C. (59° F.).

If a finger is immersed in ice-cold water, pain in it shortly becomes severe enough to be disagreeable, and a finger that has been so treated for a period of, say, ten minutes is subsequently tender and may remain so for many hours (Lewis, 1933). Sometimes in the finger that has been cooled severe burning pain is felt after it has been withdrawn from the ice-cold water; that is so if it is allowed to warm up again too quickly. This pain of recovery can be avoided by re-warming the finger very gradually. The tenderness referred to is unrelated to the pain of re-warming; it appears equally in fingers that are re-warmed slowly and painlessly.

Local Redness.—Two small cubes of ice are laid flat upon the forearms for five minutes; the ice is then removed and both forearms are plunged into water at 30° C. (86° F.), the circulation to one arm being stopped by means of a pneumatic armlet distended on the upper arm. The cooled area on the arm to which the circulation is free becomes red, and this sharply outlined redness disappears gradually in the space of about ten minutes. If now the circulation to the second arm

is released the patch of redness presently becomes defined; this redness disappears in about ten minutes after the circulation is released. Thus the reddening of the cooled forearm is not a direct response of the vessels to cold, for it can persist long after the skin has become warm again. It is due, so it is suggested, to the release of vasodilator substance or substances in the skin as a result of cellular damage; this substance is held *in situ* in the one arm, and its effects begin to decline only when, the circulation being restored, the substance begins to be removed (Lewis,* 1930).

Supercooling.—The skin, as will be described later in more detail, can be cooled below its freezing-point without freezing. It occasionally happens that such supercooling is followed by the formation of an acute wheal and flare on the skin (Lewis and Love, 1926). Such a reaction, were it a usual phenomenon, would in itself form conclusive evidence that the normal skin is directly injured by cold; for the reaction typifies the response to injury. But it is not a usual, it is an exceptional, phenomenon, depending on conditions that are still undefined. For that reason no further conclusion can be drawn from this evidence than that in subjects who display this conspicuous reaction cold can directly injure the skin.

Sensitivity to Cold.—A similar limitation applies to evidence derived from those who show extraordinary sensitivity to cold. In these a piece of ice laid on the skin for a minute is followed by conspicuous whealing. These subjects are rare; some of them suffer simultaneously from paroxysmal haemoglobinuria. The sensitivity of these skins to cold can be reproduced in other subjects by infiltrating the skin of the latter with serum from the original patient (Harris, Lewis, and Vaughan, 1929). The cases are remarkable in that whealing may be produced by temperatures as high as 18° C. (64° F.) or even, as in one case recently seen, as high as 25° C. (77° F.). I hesitate to use these two exceptional instances in evidence of the injurious effects of cold upon skins in general, in that they are not sufficiently understood and may be irrelevant; nevertheless, it is necessary here briefly to describe them, for it is also clearly possible that one or both may be no more than exaggerations of normal reactions.

Prolonged Cooling.—In recent observations I have found that if a normal hand or foot is immersed in water at 5° C. (41° F.) for a period of two hours, at the end of this time the reddened member is quite definitely swollen. The skin is less mobile: when thrown into folds these folds are broad; fine crinkling of the skin cannot be produced by manipulating it. The fingers may be swollen enough to prevent complete or easy flexion of the phalanges—either active or passive flexion. The pulps of the fingers are tenser than usual. The backs of the hands may pit perceptibly; sometimes they pit to an extent that makes it clear that not only skin but subcutaneous tissue is involved. This swelling, which may amount to as much as 15% increase of volume, gradually subsides in a few hours. It is not the simple result of imbibition of water by the skin, though some imbibition by the horny layer undoubtedly occurs, for it happens in a hand protected by grease or by the wearing of a loose rubber glove. It can occur recognizably in hands immersed in water for periods of hours at temperatures as high as 10° or 15° C. (50° or 59° F.). This effect is attributed to an injury by cold; presumably the reaction, as is customary in injury, involves the release of H-substance, which in turn acts on the blood vessels. Here it should be stated that histamine (1 c.cm. of 1 in 30,000 base) injected into the skin of the forearm, deep to the skin, is followed by obvious subcutaneous swelling. If several such swellings are made near to each other, distinct pitting of the arm occurs with firm pressure. Thus release of a histamine-like substance would account for swelling both of skin and of subcutaneous tissue.

In the swelling of a hand to cold, as much as 50 c.cm. increase of volume may be found. It is obvious, therefore, that if several of the limbs become cold for a period of hours, as when immersed in sea water or when submitted to other comparable exposure, a very substantial amount of fluid might be lost from the circulation. Perhaps this reaction may account for or contribute to a state of circulatory collapse in wounded or unwounded men exposed to severe cold.

The observations upon human skin here referred to are all such as arise soon after cooling, and are in the nature of acute reactions of the skin; the reactions illustrate the simplest forms of inflammation, characterized by heat, redness, and swelling. There are in addition a number of conditions associated with more prolonged actions of cold and with more prolonged reactions. These will be considered separately in the next lecture.

* Correcting the interpretation of an earlier observation (Lewis and Love, 1926).

REFERENCES

Grant, R. T. (1930). *Heart*, **15**, 281.
—— and Bland, E. F. (1931). Ibid., **15**, 385.
—— and Pearson, R. S. B. (1938). *Clin. Sci.*, **3**, 119.
Harris, K. E., Lewis, T., and Vaughan, J. M. (1929). *Heart*, **14**, 305.
Lewis, T. (1930). Ibid., **15**, 177.
—— (1931). Ibid., **15**, 351.
—— (1933). *Clin. Sci.*, **1**, 175.
—— and Love, W. S. (1926). *Heart*, **13**, 27.
—— and Pickering, G. W. (1936). *Clin. Sci.*, **2**, 149.
Pickering, G. W. (1932). *Heart*, **16**, 115.

FAILURE OF IN VITRO TESTS AS A GUIDE TO THE VALUE OF STORED BLOOD

BY

P. L. MOLLISON, M.B., M.R.C.P.

AND

I. MAUREEN YOUNG, B.Sc.

(*S.W. London Blood Supply Depot*)

Many different solutions are still in use for the preservation of blood during storage. This state of affairs seems to be due mainly to the different criteria that are accepted for the comparison of one solution with another. It will be generally admitted, first, that the value of stored blood, contrasted with that of stored plasma or serum, lies chiefly in its content of erythrocytes, and, secondly, that the real worth of these stored erythrocytes must lie in their ability to survive in the recipient's blood stream after transfusion. Nevertheless, most workers have accepted changes occurring in the erythrocytes *in vitro* as an indication of the value of a given method of preservation—in some cases, at least, assuming that such changes are correlated with *in vivo* survival. The changes most commonly measured are alterations in the osmotic fragility of the erythrocytes and the rate at which spontaneous haemolysis occurs during storage.

Criterion of Positive Value of Preservatives

The power to inhibit haemolysis during storage is certainly a desirable property in any preservative solution, since there are limits to the amount of haemolysed blood that may be safely injected into the blood stream. This, however, is a negative property, correlated with safety but not necessarily with value. The only procedure which seems to us to provide a criterion of the positive value of a given preservative solution is to follow the fate of the transfused erythrocytes in the recipient's blood stream. The *in vivo* survival may be measured by the differential agglutination method originally described by Ashby (1919). In brief, this consists in the transfusion of cells of Group O (IV) to a recipient of Group A (II). After transfusion the recipient's blood contains two types of cells, O and A. The A cells can be "removed" with anti-A serum and the free (O) cells counted. Actually a small fraction of the A cells are not agglutinated, and constitute a "blank" value to be deducted from the total of free cells. By counting the number of donor cells surviving at different intervals of

time after transfusion, a sufficiently accurate picture may be formed of the survival of the donor cells in the recipient's blood stream.

Using this method, we have tested eighteen different preservatives in a series of over 100 transfusions of stored blood of various ages. In each case the commonly accepted *in vitro* tests were also applied to the blood immediately before transfusion. Data are presented here which emphasize that these *in vitro* qualities are unsound guides to the actual survival of the same erythrocytes when transfused.

In Table I is set out the constitution of three different preservative solutions. In Table II observations on blood stored for varying lengths of time with these solutions are recorded. The *in vitro* properties of the erythrocytes of a given sample and the corresponding *in vivo* survival of the erythrocytes from the same sample are tabulated.

TABLE I.—*Constitution of the Three Preservatives*

	c.cm.
(I) *Citrate - Glucose (Rous - Turner):*	
3.8%* sodium citrate	400
5.4% glucose	1,000
Blood	600
(II) *Citrate - Glucose:*†	c.cm.
3% sodium citrate	100
30% glucose	10
Blood	430
(III) *Citrate - Sucrose (Wilbrandt, 1940):*	c.cm.
10% sodium citrate	63
10.3% sucrose	375
Blood	500

A sample of this concentrated cell suspension was kept for the performance of *in vitro* tests, and the rest was used for transfusion. Three *in vitro* properties were measured:

1. The Degree of Spontaneous Haemolysis—i.e., the amount of free haemoglobin in the plasma expressed as a percentage of the total haemoglobin content of the sample.

2. The Increase in Haemolysis following a Standard Amount of Shaking in the Presence of Glass Beads.—The figures in Table II express the percentage of haemoglobin (Haldane) found in the plasma after shaking a sample of standard concentration. Previous workers have pointed out that the fragility of erythrocytes to shaking increases during storage, but the relationship of this increasing "mechanical fragility" to subsequent *in vivo* survival of stored erythrocytes has not previously been studied. It is interesting to note that Rous and Turner pointed out in 1916 that there is no constant relation between the mechanical and osmotic fragilities of erythrocytes.

3. Fragility to Hypotonic Saline.—In the table only the mean corpuscular fragility (M.C.F.) is recorded—i.e., the percentage NaCl in which 50% of the cells lyse (Dacie and Vaughan, 1938).

After the preliminary withdrawal of a sample of blood from the recipient the transfusion was begun, and was usually completed in two hours or less. A second venous sample was obtained five to ten minutes after the end of the transfusion. Further samples were taken four to eight hours after the transfusion, at twenty-four hours, and thereafter at suitable intervals.

The number of donor cells found in the first sample after transfusion was taken as 100% survival. Subsequent counts were expressed as percentages of this figure. To take this figure as 100% is, of course, not strictly accurate. If the transfusion causes an increase in blood volume, and this is subsequently readjusted (i.e., after the collection of the first sample), the number of donor cells will appear to increase. Conversely, if destruction of erythrocytes has already occurred by the time that this sample is taken, to reckon as 100% the figure found makes survival seem better than it really is. From Table II it will be seen that a sample obtained four to eight hours after the transfusion often shows a relative increase of surviving cells compared with the number found immediately after transfusion and that destruction is dominant with the older bloods only. It may

TABLE II.—*Findings with the Three Preservatives described in Table I:* (1) In vitro *Tests.* (2) In vivo *Survival of Cells from the Same Sample. All the Recipients were Women suffering from a Secondary Anaemia*

Time of Storage (Days)	1. In Vitro Tests: Spontaneous Haemolysis (% Total)	Mechanical Fragility (% Free Hb after Shaking)	Osmotic Fragility (M.C.F.) (% NaCl)	Recipient's Age (Years)	2. Survival In Vivo: Percentage Survival at Various Intervals of Time — 4–8 hours (%)	24 hours (%)	1 week (%)	1 month (%)
Blood Stored in Preservative I								
16	0·2	25	0·64	22	99	101	87	70
18	0·4	15	0·74	30	—	96	89	58
21	0·1	29	0·67	28	105	99	94	69
24	0·6	32	0·76	35	85	66	76	52
27	0·3	34	0·72	29	111	84	73	44
28	1·2	34	0·80	38	—	88	65	42
34	0·9	50	0·78	31	84	54	0	0
Blood Stored in Preservative II								
12	0·1	18	0·47	45	112	93	100	71
18	0·2	22	0·51	38	122	88	67	46
19	0·7	32	0·62	30	89	76	73	36
23	2·2	34	0·64	22	—	62	39	13
29	3·0	40	0·68	30	84	39	32	0
Blood Stored in Preservative III								
7	0·3	20	0·27	33	90	93	83	66
9	0·1	28	0·28	73	82	91	75	49
12	0·5	37	0·29	55	80	76	54	0
14	0·6	38	0·37	28	92	32	—	—
16	0·7	40	0·37	—	88	29	—	—

Explanation of Methods and of the Terms used in Table II

On the day of transfusion the stored blood to be tested was carefully removed from the refrigerator. The bulk of the supernatant plasma was siphoned off and the remaining cells from two or more bottles of identical age were pooled.

* DeGowin, Harris, and Plass (1940) have pointed out that Rous and Turner used a different salt of sodium citrate from that in present use. The solution employed by us contains a higher percentage of sodium citrate than the original mixture.

† This is a minor modification of the preservative solution recommended in the Medical Research Council's War Memorandum No. 1.

be assumed from this initial relative increase that considerable destruction does not occur during the first few hours after transfusion, except with the older bloods, and the influence of this factor is therefore small.

A further check upon the actual number of donor cells found in the recipient's circulation was made by counting the red cells and measuring the volume of the blood transfused; then, by taking a figure for the recipient's blood volume based on the known height and weight, the expected concentration of donor cells in the recipient's blood stream could be calculated. In this way it could be demonstrated that approximately the expected number of donor cells appeared in the recipient's blood stream.

Results

The findings set out in Table II are representative of the larger number of samples that have been studied. In order to facilitate comparison the *in vitro* qualities of four samples stored with each of these preservatives have been averaged and set against the average *in vivo* survival of the same samples (arbitrarily taken at one month after transfusion) (see Table III). The ages of the samples stored with

TABLE III

Preservatives	In Vitro Tests			Survival In Vivo
	Spontaneous Haemolysis (% Total)	Mechanical Fragility (% Total)	Osmotic Fragility (M.C.F.) (% NaCl)	Percentage Survival at One Month
I. Citrate–Glucose (Rous–Turner) ..	0·5	38	0·74	54
II. Citrate–Glucose (usual)	1·5	43	0·61	24
III. Citrate–Sucrose (Wilbrandt) ..	0·6	51	0·34	0

In the above table average figures for *in vitro* findings are compared with *in vivo* survival. For this comparison 4 examples of storage with Preservative I (at 18, 21, 24, and 28 days) have been contrasted with 4 examples with Preservative II (at 18, 19, 23, and 29 days). In the case of Preservative III, with which survival is so much inferior, 3 younger samples (12, 14, and 16 days) were chosen for comparison.

Preservatives I and II are comparable, but in the case of Preservative III younger samples have been chosen because of the much poorer survival. Since the cases are representative of a larger series that has been studied, the following conclusions seem justified:

The survival of transfused cells is better after a given period of storage with Preservative I than with Preservative II and is much less good with Preservative III.

The osmotic fragility of stored erythrocytes is no guide to their subsequent *in vivo* survival. It might appear from this small series that there is even an inverse correlation between osmotic fragility and survival; findings with other preservatives, however, show that there is no constant relation.

A small amount of haemolysis in a given sample does not necessarily imply good *in vivo* survival—e.g., Preservative III.

Fragility to mechanical trauma is only a very approximate guide to survival.

Other Preservatives

Other anticoagulant solutions studied in this way include heparin, sodium citrate with and without glucose in different concentrations and dilutions, "I.H.T.,"* citrate - dextrin, and combinations of sucrose, glucose, and sodium citrate; defibrinated blood was also tested. The findings with these other systems support the contention that fragility to hypotonic saline is no guide, and other commonly measured *in vitro* properties are at best a poor guide, to subsequent survival.

* "I.H.T." is the name given to an anticoagulant solution containing 0.5% sodium citrate, 0.7% NaCl, and traces of other salts; this solution has been much used in Russia (Bagdassarov, 1937).

On the basis of *in vivo* survival tests the preservative solutions used fall into two main groups: (1) systems containing no glucose; (2) systems containing glucose.

1. The first group includes heparinized blood, defibrinated blood, blood stored with "I.H.T.," with sodium citrate, and with citrate - sucrose and citrate - dextrin mixtures. After the transfusion of blood previously stored with any of these anticoagulant solutions for less than seven days the erythrocytes are found to survive extremely well—i.e., virtually as well as those of fresh blood. (After a fresh-blood transfusion it is found that the donor cells are slowly and steadily eliminated over a period of approximately 100 days—i.e., about one-third are eliminated during each month after transfusion (Ashby, 1919; Martinet, 1938).) Subsequently deterioration is rapid, and after two weeks' storage the majority of the transfused cells are usually eliminated from the recipient's circulation within twenty-four hours of the transfusion. To particularize, blood stored with a large relative volume of 3% sodium citrate falls below the average for this group, whereas blood stored with dextrin survives a little better than the average.

2. In general, blood stored with glucose survives extremely well after transfusion—i.e., virtually as well as fresh blood—when it has been stored for less than fourteen days. (This is a slightly more conservative estimate than one previously made with a similar type of anticoagulant solution (Mollison and Young, 1940).) There is a progressive deterioration during the third week of storage, but blood stored with glucose for three weeks is usually not completely eliminated from the recipient's circulation for more than a month after transfusion. These remarks apply to citrate - glucose mixtures in which the volume of preservative solution is small compared with the volume of blood (e.g., Preservative II). Survival was not found to be improved by increasing the concentration of glucose in the same relative volume of preservative solution By adding a relatively greater volume of 5.4% glucose, however, survival is improved, and when the proportions of Preservative I are reached a clear-cut superiority is demonstrable. Thus after three weeks' storage with Preservative I survival is still almost as good as if the erythrocytes were fresh. It might appear from this that dilution is one of the factors responsible for the superiority of the Rous - Turner preservative solution. However, in the absence of large amounts of glucose, dilution was found to have an unfavourable effect upon survival, and it therefore seems that the problem requires further investigation.

The addition of sucrose to various citrate - glucose preservative solutions has a favourable effect upon the osmotic fragility of the stored erythrocytes but does not significantly influence their subsequent *in vivo* survival.

Practical Application of these Results

Owing to the low protein content of plasma obtained from blood stored with Preservative I it is not expected that this type of preservative will come into general use. In any case, the solution has to be modified if it is to be used directly for transfusion, because of the large amount of citrate it contains. DeGowin and Hardin (1940) have reported very satisfactory results from such a modification. Storage of blood with Preservative II gives adequate preservation for two weeks and has the advantage of providing plasma with a protein content of approximately 5 grammes %. This preservative solution is virtually the same as that at present in use at the Medical Research Council's Blood Supply Depots, and, as has been mentioned above, it does not seem to be improved by increasing the concentration of glucose.

It may be well to call attention to a few instances from the literature in which fallacious conclusions have been

drawn from *in vitro* tests, and to emphasize that some of the solutions that have been recommended are not in fact the best for preservation. Thus Rous and Turner (1916) concluded that sucrose was practically as good a preservative as glucose for human erythrocytes because of its power to inhibit haemolysis during storage. As we have shown, sucrose is an inferior preservative, judged by its failure to improve *in vivo* survival. Maizels and Whittaker (1939) suggested the use of dextrin because it, too, inhibits the haemolysis of blood during storage. *In vivo* survival tests show that the use of dextrin during storage has only a very slight effect on the survival of the subsequently transfused erythrocytes.

In the selection of the optimal citrate - glucose preservative solution, osmotic fragility tests are, as we have shown, positively misleading. Nevertheless, such tests have been adopted as the main criterion of value by many workers (Bushby, Marriott, Kekwick, and Whitby, 1940 ; Denstedt, Osborne, Roche, and Stansfield, 1941 ; Dubash, Clegg, and Vaughan, 1940) ; the preservative solutions recommended by these authors therefore contain only small amounts of glucose.

It is clear that no new preservative solution should be recommended until its effect on the subsequent *in vivo* survival of the erythrocytes has been determined.

Fate of "Fragile" Cells after Transfusion

A corollary of the view that the osmotic fragility of stored erythrocytes is an indication of their ability to survive *in vivo* must be that cells with an increased osmotic fragility soon rupture when introduced into the recipient's blood stream. Such a view has been expressed by Denstedt *et al.* (1941), for example. If this were true there would be two possible findings immediately after the transfusion of blood with a raised osmotic fragility. Either the recipient's blood stream would contain numerous fragile erythrocytes, in which case the osmotic fragility curve of the recipient would be found to be altered, or, if the donor cells had already ruptured, there would be free haemoglobin in the recipient's plasma and *in vivo* survival tests would show far less than the expected number of donor erythrocytes.

In practice neither of these possibilities is observed: On the contrary, first, transfusion of blood with an increased osmotic fragility does not affect the fragility curve of the recipient ; secondly, following the transfusion of such blood, haemoglobinaemia is not observed ; and, further, the expected number of donor cells is found, at least temporarily, in the recipient's blood stream. From this one can only conclude that the osmotic fragility of the donor cells has undergone a considerable change.

The above statement is based upon observations with preservatives containing glucose. For example, when blood that had been stored for twenty-one days in Preservative I was transfused, the curve of osmotic fragility of erythrocytes taken from the recipient, both before and after the transfusion, was estimated. Although the M.C.F. of the donor erythrocytes had been found to be very high (i.e., 0.78% NaCl) immediately before being used for transfusion, the osmotic fragility curve of samples taken from the recipient before and after the transfusion showed no difference. The transfusion occupied approximately forty-five minutes, and the sample was obtained about five minutes after the transfusion had been completed. Both before and after transfusion, in estimating the osmotic fragility, it was found that haemolysis began in 0.46% saline and that 50% of the cells lysed in 0.39% saline.

The *in vivo* survival test showed that the recipient's blood stream contained approximately 560,000 donor cells per c.mm. (the expected number) immediately after the transfusion, and thus the only possible conclusion is that the donor cells must have undergone a change in osmotic fragility.

This reversal of changes in osmotic fragility may also be studied *in vitro*. For instance, in the case referred to above a sample of the donor cells was placed in fresh compatible plasma for one hour and its osmotic fragility was then re-estimated. It was found that the M.C.F. of the cells had practically reverted to normal (actually 0.45% NaCl). This effect was found to be constant with this particular preservative. It should be pointed out that although the majority of the cells in a given sample succeed in re-acquiring an approximately normal resistance to hypotonic saline, a few may rupture. The most likely explanation of this reversal in osmotic fragility is that glucose is washed out of the cells when they are placed in a solution of relatively high tonicity at room temperature.

Reversal of osmotic fragility was not found to occur with blood stored in certain other preservatives. For instance, when erythrocytes that had been stored with Preservative III were placed in fresh plasma their mean corpuscular fragility did not appear to be affected. This is probably because alterations in the base content of the erythrocytes have occurred and because base is not so mobile as glucose. Nevertheless, the fact that the M.C.F. of stored erythrocytes can be altered in certain circumstances by allowing them to stand in fresh plasma is a further reason for regarding the osmotic fragility, as usually measured, as being an artificial criterion of value.

Summary

The *in vivo* survival of the erythrocytes of stored blood following transfusion cannot be predicted from a knowledge of the results of the commonly accepted *in vitro* tests made upon the sample. The results of work based upon such *in vitro* tests may therefore be completely fallacious.

Many different preservative solutions have been tested for their effect on the *in vivo* survival of the subsequently transfused erythrocytes. Some details of results obtained with three of these solutions are given and results with the rest are summarized.

We should like to thank Dr. J. F. Loutit, director of this depot, for facilitating these investigations. We also wish to thank Dr. M. Maizels for helpful criticism.

REFERENCES

Ashby, W. (1919). *J. exp. Med.*, **29**, 267.
Bagdassarov, A. (1937). *Sang*, **11**, 466.
Bushby, S. R. M., Marriott, H. L., Kekwick, A., and Whitby, L. E. H. (1940). *Lancet*, **2**, 414.
Dacie, J. V., and Vaughan, J. M. (1938). *J. Path. Bact.*, **46**, 341.
DeGowin, E. L., and Hardin, R. C. (1940). *British Medical Journal*, **2**, 1.
—— Harris, J. E., and Plass, E. D. (1940). *J. Amer. med. Ass.*, **114**, 850.
Denstedt, O. F., Osborne, D. E., Roche, M. N., and Stansfield, H. (1941). *Canad. med. Ass. J.*, **44**, 448.
Dubash, J., Clegg, O., and Vaughan, J. M. (1940). *British Medical Journal*, **2**, 482.
Maizels, M., and Whittaker, N. (1939). *Lancet*, **2**, 1219.
Martinet, R. (1938). *Sang*, **12**, 15.
Mollison, P. L., and Young, I. M. (1940). *Quart. J. exp. Physiol.*, **30**, 313.
Rous, P., and Turner, J. R. (1916). *J. exp. Med.*, **23**, 219.
Wilbrandt, W. (1940). *Schweiz. med. Wschr.*, **70**, 731.

The American Film Centre, 45, Rockefeller Plaza, New York City, has established a section on films in health education and medicine under the charge of Dr. Adolf Nichtenhauser. The new section will be a clearing-house and information centre on the use and production of technical films of this character. From it the centre will evaluate existing health films in collaboration with health experts and publish lists of recommended films. Attention will also be paid to the technical medical film, especially with regard to its use in medical schools. The American Film Centre is an educational organization established three years ago and supported by the Rockefeller Foundation, which has now made a three-year grant towards the Section on Health and Medical Films.

"WOUND PHAGEDAENA"

REPORT OF TWO CASES

BY

ALEXANDER CALLAM, D.Sc., M.D., F.R.C.S.Ed.

Honorary Surgeon, Victoria Hospital, Burnley

AND

ALEXANDER DUFF, M.D., F.R.C.S.Ed.

Resident Surgical Officer, Municipal General Hospital, Burnley

The term "phagedaena" suggests to the modern student of surgery a sloughing condition of the male external genitalia arising in connexion with a venereal infection and caused by anaerobic organisms. For many past generations of surgeons, however, it had a much wider application, and was one of the varieties of "hospital gangrene"—that dreaded miscellany of septic infections now happily almost unknown. For the reasons stated later we consider that the following two cases may be fitly described under this title.

Case Reports

Case 1.—A man aged 46 had appendicectomy performed (A. C.) for acute appendicitis on December 8, 1939. His illness was of seven days' duration and the appendix was perforated, so that it was considered advisable to drain both the abdomen and the wound. The wound discharged, but the temperature remained normal until the eleventh day, when a rapidly spreading inflammation of the edges became apparent. The temperature became irregular (about 101°) and later intermittent with a maximum of 100°, and there was pain in the wound region. By the eighteenth day three-quarters of the area of the abdomen was involved, the skin and subcutaneous tissue having disappeared entirely, leaving the muscle exposed. A further area around was swollen and purple, and discharged pus at many separate points; this area was very tender. Pus taken from the wound on the eighteenth day was examined (Dr. A. Beck) and showed streptococci, Gram-positive diplococci, and *B. proteus*. The streptococci were non-haemolytic, and grew both aerobically and anaerobically. In view of this report and of Meleney's work, dressing with a zinc peroxide cream was tried, but the condition spread very rapidly and the patient died on the twenty-first day after operation.

Case 2.—A man aged 54 had had an empyema operation in 1933, and discharge from the scar had recurred annually ever since. Two weeks before admission he had had incision and drainage at another hospital; the wound was still discharging. On examination on September 7, 1939, two soundly healed scars were seen over the left posterior axillary line. A little further back there was a granulating area about two inches in diameter and apparently healthy; still further back was a small ulcerated area with sloughing edges. *X*-ray examination (Dr. J. Grieve) showed neither residual empyema nor sequestra in the resected rib. There was no evidence of gas in the tissues. A tentative diagnosis of post-operative cutaneous gangrene was made. Under a general anaesthetic the edges of the ulcer were excised (A. D.). No trace could be found of any sinus leading into the chest.

After the operation a slow painful inflammatory process with much sloughing continued to spread through the skin and subcutaneous tissues of the back. Treatment with uleron, and later with sulphanilamide, had no effect; local application of orthoform appeared to lessen the pain, which was severe. In a few weeks the condition had reached the stage shown in the accompanying illustration. The whole of the area originally involved had healed, but the inflammation had spread at the same time in a radiating manner across the back. The appearance was that of an immense carbuncle—patches of purple skin riddled with discharging spots and in places undermined. There was no special tenderness at the edges, but severe pain was felt in the affected area. A moderate secondary anaemia, a leucocyte count of 7,200, and a negative Wassermann reaction were observed.

The pus was examined (Dr. G. A. Cary Lynch) on September 28. Aerobic culture yielded *B. proteus* and other organisms, but no haemolytic streptococci. Anaerobic culture gave a free growth of non-haemolytic streptococci. On repetition a week later, *B. proteus*, diphtheroid bacilli, and non-haemolytic streptococci were found on aerobic culture, with a feeble growth of streptococci only on anaerobic culture.

Under treatment with zinc peroxide considerable healing resulted, but the inflammatory process was never abolished at all places at once. A serpiginous ulceration continued for months, the patient's condition gradually deteriorating. There were only occasional slight rises of temperature. Copious sputum developed; this was found to contain streptococci and numerous other organisms but no tubercle bacilli. The streptococci were not strictly anaerobic, but grew better aerobically.

By April, 1940, the patient's condition was very low. On account, no doubt, of the long-continued pain and toxaemia, symptoms of confusional insanity appeared, and it was obvious

Photograph of Case 2, showing healed area, area of active ulceration, and surrounding purple area of skin.

that any measure which held out a hope of cure was justified. A very wide excision of the two remaining active areas was carried out (A. D.). Each area was the size of the palm of the hand; all tissue down to muscle was removed, and the excision was carried well beyond the surrounding reddened area of skin. Improvement was very rapid, the mental symptoms disappeared, and the patient was discharged three months later practically healed. He was seen on June 29, 1941, and was then completely healed and back at work. The scar covered the whole left half of the back, was pliable and healthy, and gave him no trouble.

Discussion

Somewhat similar cases have been described by Meleney (1933) under the title of "post-operative progressive bacterial synergistic infective gangrene of skin," by Langston (1938) as "progressive streptococcal ulceration," and by Mitchiner and Cowell (1939) as "spreading subcutaneous or cutaneous gangrene." The last-named authors identify the condition with "hospital gangrene."

Clinical Features.—The articles referred to all give such clear accounts of the clinical features that these need only

be summarized briefly here. The time of onset is from a few days to two weeks after an operation for an infective condition, or the process may arise at any time in connexion with a discharging sinus. The edges of the wound and surrounding area quickly assume the appearance of a large carbuncle. Although suppuration is profuse there is little general reaction. Great tenderness of the inflamed area is usual, unremitting pain is characteristic, and there is severe secondary anaemia.

Course.—The condition may be acute or chronic. Case 1 was so rapidly progressive as to be almost inevitably fatal. Chronic cases are characterized by the slow progress of the lesion and the tendency to heal at one area while spreading at another. Meleney (1935) reports one case of spontaneous healing after twenty-six months. Usually, however, the patient is worn out mentally and physically by pain and toxaemia. Fraser (1919) remarks that in gas gangrene the mind remains acute to the end, in striking contrast to the mental confusion in Case 2.

Prognosis.—There are not enough data to enable us to make an accurate estimate of the mortality, but published accounts leave an impression that it is about 50% whatever treatment is adopted.

Bacteriology.—In our cases non-haemolytic anaerobic streptococci with *B. proteus* were the significant organisms. The streptococci became aerobic later—a tendency noted by Douglas, Fleming, and Colebrook (1920). These workers found that practically all streptococci in infected wounds were anaerobic at first, and emphasize the necessity for anaerobic culture in all such cases. Milian (1930) and Nativelle (1930) found a bacillus of the *proteus* group with streptococci in cases of cutaneous gangrene. They consider that streptococci facilitate the action of the *B. proteus*. Diphtheroid bacilli were reported by Meleney and in our Case 2, while virulent diphtheria bacilli were present in Langston's. Douglas, Fleming, and Colebrook (1920) reported true diphtheria bacilli in 4 of 61 infected wounds, while Fleming (1919) found that they had a powerful stimulating action on streptococci. While, therefore, various organisms and combinations of organisms may be responsible, both our cases were due to an association of non-haemolytic streptococci with *B. proteus*. The diphtheroid bacilli were not an essential part of the infection, being absent in Case 1 and present only in the later stages in Case 2.

Aetiology.—The reasons for the establishment of this particular variety of infective process are obscure. The organisms were probably present in the original infection, and M.R.C. War Memorandum, 1940, No. 2 (p. 2), draws attention to the importance of the presence of necrotic material or foreign bodies in the establishment of anaerobic infections. Cross-infection may be excluded, since the cases were treated by us separately in different hospitals and without any other similar cases occurring in either.

Investigation.—This concerns the surgeon in so far as he provides the bacteriologist with his original material. The recent memorandum recommends the swab, and this was used in the present cases. Since the process spreads centrifugally and not deeply, the advice given to take material from the deepest part scarcely applies. The spreading edge is the most suitable site for obtaining a specimen. The memorandum makes no mention of examination of excised tissue such as was performed by Meleney. It appears to us that such examination might enable the bacteriologist to distinguish between contaminants and organisms actively invading the tissues.

Diagnosis

We consider that these two cases are examples of a well-defined clinical entity whose essential features are: (1) it arises in connexion with an infected wound; (2) anaerobic streptococci, later becoming aerobic, and *B. proteus* are present; (3) the lesion spreads through skin and subcutaneous tissues, but not deeper. These considerations enable it to be distinguished from most of the other conditions mentioned by Stewart-Wallace (1935)—namely, common wound infection, erysipelas, ecthyma gangraenosum, specific infections, amoebiasis cutis, and fuso-spirochaetal infections.

Gas Gangrene.—Although two Medical Research Council reports (1919, No. 39; 1920, No. 57) on anaerobic wound infections were published after the last war, one detailing 65 cases, the condition was not clearly differentiated from gas gangrene. Fraser describes "localized anaerobic infection in wounds" and "slowly spreading anaerobic infections," but regards these as mild varieties of gas gangrene; he does not give a separate description such as would identify them with the present cases.

Progressive Post-operative Gangrene of Skin.—This seems to be the condition most closely allied to our cases. The clinical features of Stewart-Wallace's case—a spreading carbuncular process—were in so many respects like those in our second case as to leave little doubt that these were examples of the same condition. Unfortunately the cultural characteristics of the streptococci in his case were not mentioned. Cox (1936), in a case described under the same title, found a streptococcus that was both aerobic and anaerobic, but states that the lesion was strictly confined to the skin. Langston states emphatically that his case was not one of gangrene, but the organism appears to have produced a lesion in the abdominal walls of guinea-pigs very similar to that in our first case. It appears to us that "post-operative progressive bacterial synergistic gangrene of skin" (Meleney), "spreading subcutaneous or cutaneous gangrene" (Mitchiner and Cowell), and probably "progressive streptococcal ulceration" (Langston) are all conditions essentially similar to those of our patients, and closely allied to one of the varieties of "hospital gangrene." We suggest "wound phagedaena" as a more suitable and concise term than any of the above, including all these conditions and yet excluding the others mentioned in the previous section.

Treatment

Though Meleney and Langston have had success with local application of zinc peroxide, this was unavailing in our cases, as were both uleron and sulphanilamide internally. Incomplete excision is useless, but it is to be noted that the first, evidently incomplete, excision in Case 2 did not accelerate the infective process as it might have been expected to do.

We entirely agree with Stewart-Wallace that there is no doubt at all that the correct treatment is wide excision. Probably with diathermy excision there would be less risk of leaving behind an area of tissue still containing active organisms. In view of the recent activity in research into the chemotherapy of wound infections this opinion may have to be revised soon, but any alternative treatment would have to be well founded in view of the excellent results of a well-planned excision.

Summary

Two cases are reported of a spreading infection of skin and subcutaneous tissues arising from an infected wound or sinus.

The condition appears to be one manifestation of a clinical entity, including "post-operative cutaneous gangrene" and some other similar conditions, closely related to the "phagedaena" of former times.

The infecting agent in each case was an anaerobic streptococcus associated with *B. proteus*.

One case was hopeless from the start; in the other a cure was effected by a wide excision of the lesion.

"Wound phagedaena" is suggested as a suitable name for the condition.

We have to thank our colleagues mentioned in the text for their special examinations and reports; Dr. D. C. Lamont, M.O.H. Burnley, for permission to publish Case 2; and Mr. H. Lawrie, B.Sc., for the clinical photograph.

REFERENCES

Cox, H. T. (1936). *Brit. J. Surg.*, **23**, 576.
Douglas, S. R., Fleming, A., and Colebrook, L. (1920). Med. Res. Cncl. Sp. Rep. Ser., No. 57.
Fleming, A. (1919). Ibid., No. 39, p. 87.
Fraser, J. (1919). Ibid., No. 39, p. 6.
Langston, H. H. (1938). *Brit. J. Surg.*, **26**, 254.
Meleney, F. L. (1933). *Surg. Gynec. Obstet.*, **56**, 847.
—— (1935). *Ann. Surg.*, **101**, 997.
Milian, G. (1930). *Paris méd.*, **1**, 68. (Quoted by Meleney, 1933.)
Mitchiner, P. H., and Cowell, E. M. (1939). *Medical Organisation and Surgical Pract ce in Air Raids*, p. 74, Churchill, London.
Nativelle, R. (1930). *Ann. Inst. Pasteur*, **45**, 169. (Quoted by Meleney.)
Stewart-Wallace, A. M. (1935). *Brit. J. Surg.*, **22**, 642.

ENURESIS IN ADOLESCENTS

BY

R. C. BROWNE, B.M., M.R.C.P.*

AND

A. FORD-SMITH, B.M., M.R.C.P.

(From the Nuffield Department of Clinical Medicine, Oxford)

The Subjects and their Surroundings

The subjects of these observations were boys whose ages ranged from 14 to 20 years. They were members of a farm training colony, some 300 strong, to which they had been sent by the Public Assistance Committees of England and Wales. Most of them had been brought up in institutions, and many of them had been "problem cases." In general the boys were of poor type and intelligence, inclined to lack discipline and to show anti-social traits. Many of them had started life with the adverse bias of illegitimacy, separated parents, or an unkind step-parent. The boys at the colony received training to fit them for farm, gardening, or domestic work or boot-repairing. Positions were found for them in one of these spheres at the completion of their course. They played organized games daily, with swimming in the summer, and went to the pictures once a week, on Saturdays. A few of them had started model aeroplane and fretwork clubs. The colony was run rather along Public School lines, being divided up into several houses, with the usual system of internal government. Everything was done to kindle a feeling of responsibility and public spirit, and much of the government of the colony was in the hands of the boys themselves.

Twenty-one per cent. of them were bed-wetters: this high figure is explained by the fact that the colony is one of the few in England admitting such boys, who thus tend to gravitate there. Most were intractable cases who still wet their beds when admitted to hospital in different and possibly happier surroundings. Occasionally some went home, but the trouble nearly always persisted. It was the custom to segregate the enuretic boys in a separate dormitory with beds equipped with rubber sheets. In an effort to avoid a wet bed later in the night, they were waked two hours after going to bed and made to pass water. Thus it was probable that the conditions tended to encourage enuresis rather than otherwise, in view of the segregation at night and the constant reminder, in being called, that the worst might happen. Alongside this camp there happened to be a colony of forty Jewish refugee boys of similar ages. They were mostly the sons of Austrian artisans and small shopkeepers. These boys were of good intelligence and physique, and when competing in the sports against the boys in the colony had won all the cups and prizes. Enuresis among them was unknown.

* With a grant from the Medical Research Council.

Description of Cases more fully Investigated

Twelve boys from the colony together with one from an external source were admitted to hospital for a more detailed investigation. In addition to careful histories and physical examinations, perianal swabs were taken for threadworms, the lumbar spines were radiographed for spina bifida, and an investigation was made to determine whether the boys passed an abnormal volume of urine by day or night. Intravenous pyelography was performed, and each boy was sent for interview by a psychologist. The method employed to determine whether they passed an abnormal volume of urine consisted, at first, in weighing the bed-clothes before and after sleep. This was found to be not very satisfactory, and eventually a comfortable bag for collecting urine was fitted on before they settled for the night. Ten of the boys had enuresis in hospital.

The average age of the subjects was 17, the youngest being 14 and the oldest 20. Ten of them had unsatisfactory family histories, such as the early death of the parents, a broken home, or a father who suffered from "shell shock." There was a family history of enuresis in only one case. All but one were dull, and even this boy was emotionally immature. This dullness was quite obvious on simple conversational contact, and required no special test for its demonstration. All the boys, except one whose development was retarded, were physically normal. Threadworms were found in three of them. There was no significant chemical or cytological abnormality in their urine, of which they passed a normal volume both by day and by night. Intravenous pyelograms showed normal urinary tracts in every case. Radiographs of the lumbar and sacral spines demonstrated some abnormality in nine out of the thirteen boys. This was frank spina bifida occulta in seven, but a congenital abnormality of the first piece of the sacrum was reported in one, and flattened vertebral bodies in another. The incidence of congenital abnormalities is greater than even the most generous estimates for healthy people.

Common factors in the histories and examinations that were noted, among others, were: (1) an unsatisfactory family history, often with some disruption of the home; (2) poor intelligence; (3) normal physique; and (4) a congenital spinal abnormality.

Spontaneous Course of the Disorder

A record of the number of wet beds caused by each of three boys was kept for a period of rather more than two years, during which they were untreated. This is shown in Fig. 1. It will be seen that the disease follows an irregular course, being slightly less troublesome in midsummer. In the case of boys C. and M. there was an exacerbation in the early part of 1940 corresponding to the intense cold at that time. Boy W., however, seemed to be unaffected by this. The course of the illness is not unlike that of epilepsy, a similarity which fits in with the low level of intelligence of most of the boys. The frequency of spina bifida occulta further suggests some abnormality in the central nervous system. The demonstration of spontaneous remissions naturally raises the question of any treatment used If a

spontaneous remission coincides with the administration of a particular drug or treatment, improvement may be wrongly attributed to the latter.

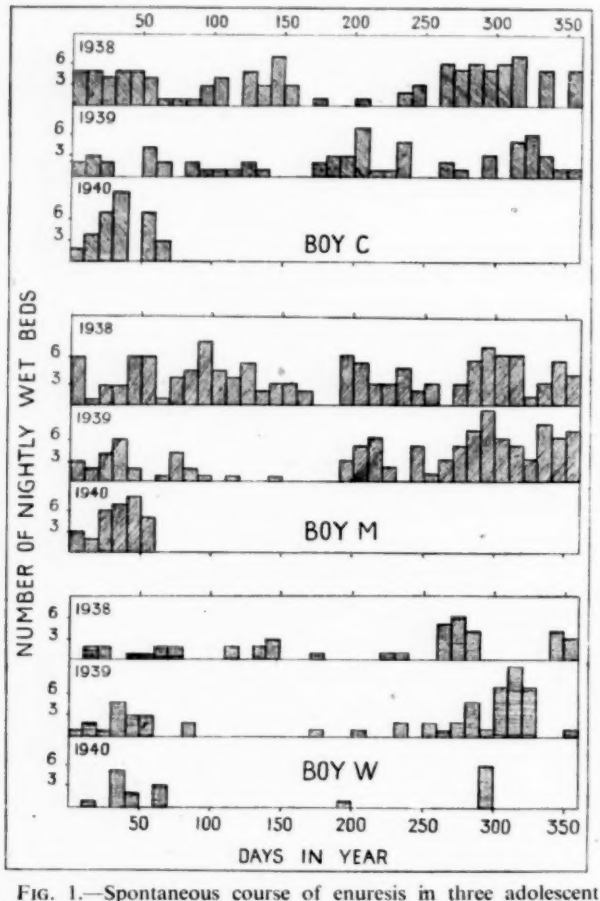


FIG. 1.—Spontaneous course of enuresis in three adolescent boys. The uprights represent the number of nights the boy wetted the bed during each ten-day period.

Effect of Various Drugs

Two groups of six boys sleeping on opposite sides of the same dormitory were investigated. The weekly number of wet beds was collected and expressed as a percentage of the total possible number, assuming each boy had wet his bed every night. The two groups were studied continuously for a year. At night before going to bed each group was given a drug alternately, the other having inert control tablets similar in size, shape, and colour. At the end of the week the conditions were reversed. Occasionally no drugs or control tablets were given either group of boys. One of the masters or prefects at the colony gave the drugs. Once when it was suspected that they were not being administered, methylene-blue tablets were given, and a random boy chosen who urinated in our presence. The colour of his urine showed that the suspicion had been groundless. The drugs were given in doses which are the maximum or above the maximum of those in common use (see Table).

Fig. 2 shows the number of wet beds throughout the experimental time, for both treated and control groups; the mean weekly temperature is included in the graph. Just as with the three individual boys, it seems as if the disease runs an irregularly rhythmic course with no apparent relation to drug therapy, and is only slightly affected by the temperature of the weather at the time. The number of wet beds in both groups was nearly equal, the control group having 45% of the total possible, and the group receiving supposedly active drugs 46%. None of the drugs given had a definite action on the enuresis. This was most strikingly shown in the case of belladonna, in spite of its reputation in this disease; for when the drug was given in the massive dose of 4 grains the treated group became worse whereas the control group improved. During that week one of the treated boys showed symptoms of atropinism and became manic. The table shows these results and indicates the weeks in which each drug was given. In addition to the drugs mentioned in the table, amital (Lilly), prominal (Bayer), pseudo-ephedrine (Burroughs Wellcome), and torantil (Bayer) were also tried without success.

Table showing Effect of Drugs upon a Group of Six Enuretic Boys

Drug	Dosage in Grammes	Better	Worse	Weeks Administered, Inclusive
		Weeks	Weeks	
Trasentin (Ciba)	0·075–0·225	3	3	2nd to 7th
Ephed. sulph.	0·06–0·24	3	2	8th to 12th
Ext. bellad. sicc.	0·06–0·24	2	2	15th to 18th
Ext. bellad. sicc. 0·06 gm. and ephed. hydrochlor. 0·06 gm.	1–4 tablets	2	1	19th to 21st
Phedracin (Ciba)	0·4–0·6	0	3	22nd to 24th
Methylatropin. nit. (eumydrin, Bayer)	0·003–0·005	2	1	26th to 28th
Physostig. salicyl.	0·0013–0·0026	1	1	29th and 30th
Theophyll. mono-ethanolamin. (theamin, Lilly)	0·2–0·4	3	1	31st and 32nd, and 34th and 35th
Mersalyl 0·08 gm. and theophyll. 0.04 gm.	2 tablets	1	1	36th and 37th
Methylthionin. chlor	0·3	1	1	38th and 39th
Barbitone soluble	0·6	1	1	40th and 41st
Sod. diphenylhydantoin (solantoin, Glaxo)	0·2	2	1	42nd to 44th

Two diuretics were administered—theamin, a xanthine derivative, and mersalyl, an organic mercury compound combined with a xanthine derivative. The absurd result was obtained that improvement occurred in three out of four weeks when mersalyl was given, deterioration taking place during the other week.

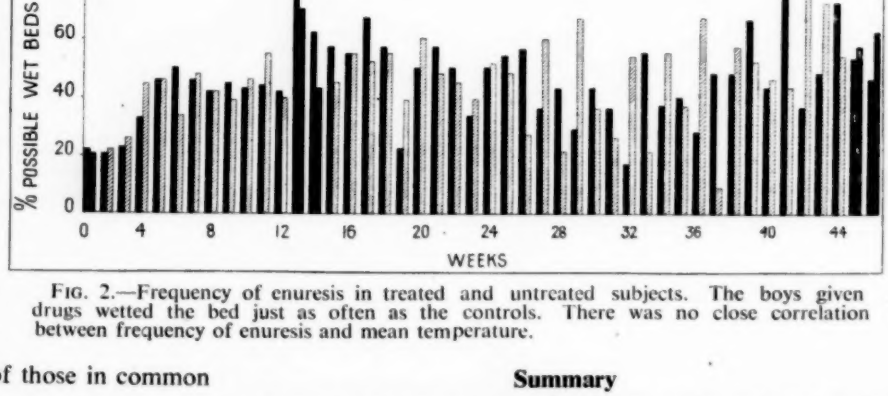


FIG. 2.—Frequency of enuresis in treated and untreated subjects. The boys given drugs wetted the bed just as often as the controls. There was no close correlation between frequency of enuresis and mean temperature.

Summary

Enuresis in a group of adolescents in a farm training colony was usually accompanied by unfortunate home conditions, poor intelligence, a normal physique, and a high incidence of occult spinal deformities.

The disease followed a rhythmic but irregular course; it was more frequent in cold weather, but the correlation was not close.

In a controlled therapeutic experiment on a group of twelve boys a series of drugs, including belladonna and ephedrine, was tried. None had any effect on the enuresis.

We are indebted to Lieut.-Col. R. C. Grant for generously assisting us with the records of these cases.

A CASE OF COMBINED INTRA-UTERINE AND EXTRA-UTERINE PREGNANCY

BY

R. B. LEECH, M.B., B.Ch.

C.M.S. Hospital, Mengo, Uganda

The following case of combined intra-uterine and extra-uterine pregnancy is reported because of the rarity of the occurrence.

Case History

The patient comes from a village some forty miles away where we have one of our district maternity centres. I visit this centre every fortnight to hold a general clinic and examine any abnormal obstetric cases, which the trained African midwife collects for me in her routine ante-natal examinations. In this way I had the good fortune to examine the patient three times before she finally came into hospital here, though on none of these occasions did I suspect the true diagnosis.

Ante-natal Observations.—She was an African woman aged about 30, who had had three normal pregnancies and labours, the last some eighteen months previously. I first saw her on September 5, 1940, and diagnosed a pregnancy of four months' duration, though she said she was still having short periods at that time. I was next asked to see her on February 20, 1941, and found on abdominal examination a uterus of about nine months' gestation with swellings somewhat resembling a foetal head on each side of it. I considered the possibility of twins, but the findings did not really support this diagnosis; so, remembering the clinical axiom that common conditions commonly occur, I made the provisional diagnosis of fibroids, though I was puzzled at not having recorded any suspicion of them at my previous examination. I advised her to come into hospital a little later.

From Delivery to Laparotomy.—She went into labour on March 5, and was delivered in the maternity centre by the midwife after a normal labour; the baby was a fully developed boy weighing 5½ lb. I saw her, however, on March 6, and found the para-uterine swellings still present; I still thought they might be fibroids, but regret that I made no more than a perfunctory examination, as all seemed well. The next day the patient began complaining of abdominal pain, which slowly increased but was not severe enough to prevent her being discharged from the maternity centre a week later. The pain continued to grow worse, and she came into the central hospital here on account of it on March 27. The baby was somewhat under-nourished, as no breast milk had come in. On examination the woman was obviously ill and in pain. There was a fair pulse and some pallor. On palpation of the abdomen and vaginal examination I could come to no other conclusion but that there was an intraperitoneal extra-uterine foetus present, and I was almost convinced that I heard a foetal heart. I left her to recuperate from the journey, and performed a laparotomy the next day.

Findings at Operation.—The peritoneal cavity was filled with straw-coloured clear fluid containing large fibrinous clots. Much of the peritoneum and the whole of the great omentum were covered in a thick jelly-like material. A foetus was lying free among the coils of intestine and there was a fair pulsation in the cord. I delivered the baby, and found the ruptured sac arising from the placenta, which was attached by what amounted to little more than a thick pedicle; this sprang from the right broad ligament just behind the fimbria in the position of the ovary, there being no direct connexion with the Fallopian tube. There were also two thick bands of adhesions running from the great omentum to the sac and ending in two subsidiary placentae near the main one. The uterus appeared to be involuting normally. Removal of the sac and placentae was not difficult, and the patient is now making a good recovery. The baby was a boy weighing 6 lb., and was without evident abnormality save for clots of what seemed to be fibrin adherent to the skin in places. It breathed weakly for about half an hour, but all the usual care could not maintain life.

Commentary

The frequency of extra-uterine pregnancy is not easy to ascertain, but Schumann (1921) calculated the frequency for one year in one town to be one in every 303 pregnancies. Mall (1915) further calculates that 1% of extra-uterine pregnancies go to full term, and notes that the foetus in these cases is especially liable to maldevelopment. Cases of extra-uterine associated with intra-uterine pregnancy—referred to by Parry (1876) as combined pregnancy—have been reported a number of times, 306 having been traced by Subodh Mitra (1940); but only ten of these (according to Novak, 1926) have resulted in the birth of both children alive.

Although no ovarian tissue was found by the pathologist in the wall of the amniotic sac, the position of the placental site in this case suggested strongly that the pregnancy originated in the ovary. Ovarian pregnancy is the least common type of extra-uterine gestation, only forty-one recorded cases having been traced by Lockyer (1917); but Williams (1923) considers that a higher proportion of ovarian pregnancies go to full term than do pregnancies of tubal origin. It is of interest to note, too, that no long period of sterility preceded this pregnancy; this perhaps suggests that the mechanism believed to be largely responsible for tubal gestation—namely, some form of obstruction in the tube—did not come into play.

I can offer no special explanation of the fact that the patient had short periods up to within six months of delivery of full-term children, but have an impression that slight menstruation may continue after conception more often than in England, although histories here are very unreliable.

It seems likely that the amniotic sac of the extra-uterine foetus ruptured when the abdominal pain began, two days after the delivery of the uterine pregnancy. It was probably due to some sudden abdominal strain by the patient, or possibly even to an abdominal examination. The action of the amniotic fluid within the peritoneal cavity—that of a mild irritant—is of interest.

The breasts secreted very little milk even after the delivery of the second baby, owing perhaps to the general debility of the patient, so that no deduction can be drawn as to the inhibitory action of the extra-uterine gestation on lactation.

REFERENCES

Lockyer, C. (1917). *Proc. roy. Soc. Med.*, Sect. Obstet. Gynaec., **10**, 158.
Mall, F. P. (1915). *On the Fate of the Human Embryo in Tubal Pregnancy*. Publication 221, Carnegie Institution, Contributions to Embryology.
Novak, E. (1926). *Surg. Gynec. Obstet.*, **43**, 26.
Parry, J. S. (1876). *Extra-uterine Pregnancy*, London.
Schumann, E. A. (1921). *Extra-uterine Pregnancy*, Appleton, New York.
Subodh Mitra (1940). *J. Obstet. Gynaec. Brit. Emp.*, **47**, 206.
Williams, J. W. (1923). *Obstetrics*, 5th ed., Appleton.

R. M. Greenthal (*Wisconsin med. J.*, 1941, **40**, 25), who reviews the literature and records his observations on 100 cases, comes to the conclusion that the disease called "roseola infantum" by Zahorsky in 1910 and "exanthema subitum" by Veeder and Hempelmann in 1921 is a clinical entity. It affects children during the first two years of life and seems to confer immunity. Its characteristic features are a febrile period of three days, and after the temperature has become normal a rash lasting about two days. The blood shows a relative lymphocytosis and often a lymphopenia. There are no complications or sequelae. The aetiology is unknown. The incubation period is about ten days.

UNUSUAL RETICULOCYTOSIS IN AN UNTREATED CASE OF PERNICIOUS ANAEMIA

BY

W. TREVOR COOKE, M.D., M.R.C.P.

Medical Registrar, Birmingham United Hospital

The following case caused some difficulty in diagnosis owing to the finding of reticulocytosis of more than 30% in the presence of severe anaemia and a recent history of jaundice.

Case Report

Mrs. X., aged 30, had always been perfectly well until February, 1939, when she complained of feeling run down, with loss of appetite and energy. She had also lost some weight. Her private doctor, having treated her symptomatically with an iron mixture without response, referred her to hospital. There, no history could be elicited to account for her symptoms, while it was noted that she looked sallow and pale, although her mucous membranes were of a good colour. There was also marked pyorrhoea. Radiographs of her chest were normal, while a blood count showed a moderate anaemia: red cells, 2,570,000; Hb, 49%; colour index, 0.95; white cells, 12,000—polymorphs 72%, eosinophils 1.5%, lymphocytes 24.5%, mononuclears 2.5%. The red cells showed some anisocytosis and poikilocytosis. On account of these findings and because there had been no response to iron therapy, hepamult was prescribed in addition, and she was advised to have her teeth extracted. This was done, and she next attended the hospital two months later, feeling very much better. A blood count on this occasion showed: red cells, 4,600,000; white cells, 9,600; Hb, 92%; colour index, 1.

Shortly after this she married and moved to the Birmingham district, where she was well until March, 1940, when she again became pale and nauseated. She improved with some medicine from her doctor, but again relapsed at the beginning of July. She then became very nauseated and developed epigastric pain and jaundice—so much so that the jaundice was commented upon by her friends. She lost weight again and a great deal of energy. Headaches were very severe. She had had no haematemesis and no upset in her menstrual functions, but some slight bleeding from the rectum had occurred. There was no family history of any blood disorder. She was referred to the General Hospital for further advice one month after the onset of her most recent attack.

She was there noted to be very pale—on first appearances suggestive of a patient with a bleeding duodenal ulcer. She had a smooth tongue, a marked haemic murmur, and slight tenderness in the epigastrium. Vaginal and rectal examinations were negative. Investigations showed a macrocytic type of anaemia with 42% haemoglobin and a positive indirect and slight direct van den Bergh test (serum bilirubin, 1 unit). She was therefore admitted to the Queen Elizabeth Hospital (August 6) for further investigation. Physical examination was essentially the same as that in the out-patient department, although there was divergence of opinion as to the presence of splenic enlargement. Her faeces were benzidine-negative.

The blood examination on admission showed marked reticulocytosis (red cells, 1,420,000; *reticulocytes*, 33.4%; Hb, 34%; colour index, 1.21; white cells, 4,600—polymorphonuclears 21.25%, eosinophils 1.25%, lymphocytes 74.5%, monocytes 2.7%, neutrophil myelocytes 5.25%), while the stained films revealed great anisocytosis, slight poikilocytosis, and marked polychromasia, the platelets appearing normal.

Inquiry into her dietetic habits disclosed that she did not eat excessive amounts of meat, that she was accustomed to have liver regularly once a week, and that she had had no liver therapy from her doctor. A diagnosis of chronic haemolytic anaemia appeared probable, and Dr. T. W. Lloyd was asked to carry out investigations with this in view. On August 9 his examination with heparinized blood gave the following results:

Red cells	2,110,000
Haemoglobin	51%
Colour index	1.2
Haematocrit	21.7%
Mean cell volume	103 cubic microns
Mean cell haemoglobin concentration	32.4%
Reticulocytes	31%
White cells	1,900 per c.mm.
Polymorph neutrophils	25.5%
Eosinophils	0.5%
Premyelocytes	1%
Lymphocytes	72%
Monocytes	1%
Normoblasts	2%

A striking feature of the neutropenia, which in itself was unusual in the presence of such active red cell regeneration, was the absence of non-segmented forms, all the polymorphs being heavily segmented.

The fragility began in 0.45% and was complete in 0.25% saline, a slight increase as compared with normal. The lecithin resistance was greatly increased, thus:

Concentration of Lysolecithin	Haemolysis of Patient's Cells	Haemolysis of Control Cells
1/32	100%	100%
1/64	52%	100%
1/128	0	15%
1/256	0	0

This test was considered to exclude acholuric family jaundice. The Price-Jones curve (250 cells) showed very marked macrocytosis, mean diameter 8.78 μ. It was a homogeneous curve, and when decomposed by the method of Mogesen the main component had a mean diameter of 8.75 μ and contained 100% of the cells drawn.

The serum was examined for haematin (methaemalbumin) by Schumm's method and by spectroscopic analysis. Tests that proved to be negative were also carried out by the method of Damashek for the presence of isohaemolysins. The Donath-Landsteiner test for paroxysmal (cold) haemoglobinuria was also negative.

In the meantime the patient was improving on a normal hospital diet without any medication. A fractional test meal showed the presence of achlorhydria, and a laevulose-tolerance test gave a normal result. On admission the van den Bergh test had shown a positive biphasic reaction and a positive indirect reaction with an icterus index of 10. One month later the indirect test was still faintly positive with the icterus index at 7.4 units, while eight weeks after admission both the direct and indirect tests were negative.

In view of these findings the diagnosis of pernicious anaemia was put forward. Accordingly a test dose of liver extract

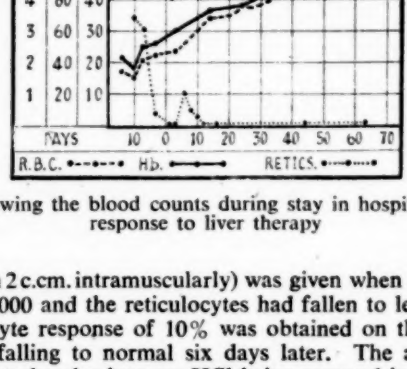


Chart showing the blood counts during stay in hospital and the response to liver therapy

(anahaemin 2 c.cm. intramuscularly) was given when the red cells were 2,300,000 and the reticulocytes had fallen to less than 1%. A reticulocyte response of 10% was obtained on the sixth day following, falling to normal six days later. The achlorhydria was shown to be absolute, no HCl being secreted in response to 1.5 mg. of histamine. Liver extract was continued with complete relief of her symptoms and restoration of the blood picture to normal (see Chart).

The patient has maintained good health for fourteen months on a fortnightly dose of 2 c.cm. of anahaemin. The most recent blood count showed: red cells 4,640,000, Hb 98%, and colour

index 1.05; the van den Bergh test was negative. The Price-Jones curve is now within normal limits, with a mean diameter of 7.014 μ.

Discussion

The striking feature of this case was the persistence of a reticulocytosis of over 30% for at least forty-eight hours in a patient who had received no treatment and the difficulty in diagnosis that this finding caused. Such a reticulocytosis, taken in conjunction with the apparently rapid onset and a history of other attacks and of jaundice, seemed to indicate haemolytic anaemia. Against this the presence of glossitis was one small point, but the negative findings of the special investigations and the subsequent findings of complete achlorhydria threw further doubt on the original diagnosis. Finally, the reticulocyte response to a test dose of liver extract associated with a rise of red cell content indicated an absence of haemopoietic factor. Such a response would be exceptional in any of the haemolytic types of anaemia. In fact, all the findings seem to indicate a diagnosis of pernicious anaemia in spite of such an unusual reticulocytosis.

Little mention is made in the literature regarding the number of reticulocytes present during the relapse phase. Sturgis and Isaacs (1938) state that spontaneous crises are sometimes seen with 7 to 8% of reticulocytes. Whitby and Britton (1939) note that occasionally pronounced reticulocytosis is present, but do not give figures. A rapid survey of other relevant publications failed to throw any light on the problem. The marked reticulocytosis in this case, following a submaximal dose of the intrinsic factor, should be due to the reaction of a young and comparatively healthy bone marrow, which has not yet become exhausted in the effort to keep up the supply of corpuscles from inadequate material. The same amount in an older person would, no doubt, only have given the reticulocytosis that is usually noted during remissions (7 to 10%).

It is interesting to speculate on the reason why this patient, accustomed to a regular and adequate diet, should suddenly relapse and with apparently equal rapidity begin to regenerate her red blood corpuscles. While we know that absence of the intrinsic factor leads to the development of pernicious anaemia, there is no definite knowledge as to the factors that lead to its disappearance. It is frequently suggested that the stomach in persons completely achlorhydric is especially disposed to gastritis, which will eventually lead to the suppression of the intrinsic factor. The history in this case supports such an idea. Dental sepsis, often put forward as an aetiological factor in earlier days, no doubt caused some degree of gastritis to initiate the first relapse. The last relapse, ushered in as it was by nausea, vomiting, epigastric pain, and jaundice, is very suggestive of gastritis with an associated "duodenitis." The relapses would then be due to a suppression of the intrinsic factor and the remissions be due to improvement in the gastritis, with a consequent return to a more normal diet and the reappearance of a small amount of intrinsic factor (cf. pernicious anaemia of pregnancy). The diagnosis of gastritis is not altogether unjustified, as for a short period after starting liver therapy the patient had nausea, vomiting, and epigastric discomfort which were relieved by a simple bismuth mixture, and also on one or two occasions since her discharge from hospital she has had short bouts of epigastric discomfort.

Summary

A case of pernicious anaemia in a young married woman aged 30 is reported. The patient presented the unusual feature of reticulocytosis of 33.4% in the absence of any previous treatment.

Administration of liver extract gave complete relief of symptoms and restored the blood picture to normal.

Good health has been maintained on a fortnightly dose of 2 c.cm. of anahaemin.

I wish to thank Prof. W. H. Wynn for permission to report this case and for his criticism and advice in preparing the manuscript; also Dr. T. W. Lloyd and Dr. A. L. Peeney for their detailed blood examinations and help in the diagnosis of this case.

References

Sturgis, C. C., and Isaacs, R. (1938). In *Handbook of Haematology*, edited by H. Downey, **3**, 2231, Hamish Hamilton, London.

Whitby, L. E. H., and Britton, C. J. C. (1939). *Disorders of the Blood*, 3rd ed., Churchill, London.

Medical Memoranda

Acquired Immunity to Blood Transfusion Reactions: A New Phenomenon

Reactions occurring during the transfusion of blood are for clinical purposes commonly divided into two main groups: haemolytic and non-haemolytic. The onset of the reactions is similar, but as a rule the former becomes progressively worse for hours or days, and often ends fatally; while the latter, alarming though it may appear, usually expends itself within an hour, leaving no observable evidence of permanent damage. It is with the latter type that this paper is concerned.

It has been our experience that the recipient, having suffered this reaction, is for some time immune to further reaction to the same blood. Hence the transfusion may with complete safety be resumed soon after subsidence of the response.

First Observations

Our first observation of this kind was made on a male Hindu aged 18 to whom a transfusion was given following amputation of a leg after a crush injury. Fifty c.cm. or so of 5% glucose solution alone was first used, and then the blood was started at the rate of about 50 drops a minute. When 150 c.cm. of blood had run in, the patient developed a severe chill, the pulse became rapid and thready, and there was marked pallor. The transfusion was discontinued promptly, the foot of the bed was elevated on shock-blocks, and hot-water bags and blankets were applied. One c.cm. of adrenaline was injected intramuscularly. The reaction, which was most violent, ran its course and subsided completely within an hour. A careful check was made of the blood, but no error was found either in the grouping or in the cross-agglutination tests. Also, the citrate solution had to be considered, although our intravenous solutions had produced no such symptoms in some hundreds of administrations. Accordingly, 50 c.cm. of the glucose-saline solution was given by vein to each of three otherwise healthy fracture patients, and 20 c.cm. of 3.8% citrate solution was injected intravenously in two other afebrile individuals. None of these subjects developed chills or fever, nor was there any significant variation in the pulse rate as a result of the injections. The reaction observed in our patient was therefore purely from the blood, and was characteristic of the non-haemolytic type, being in general essentially the same as the others of this type which we had seen here and elsewhere.

The Hypothesis of Anaphylaxis

Because of its typical character this case was chosen to test a hypothesis which had occurred to us: that the reaction is anaphylactic in nature. If this were an anaphylactic response the patient had very likely become desensitized, and it should be possible, therefore, to continue the transfusion without further response. Accordingly, some five hours after the patient's recovery the transfusion was resumed, the blood being run into the vein very slowly, while careful watch was kept for any untoward symptoms. The transfusion was completed without the slightest reaction.

With this as a precedent, in every other case of transfusion shock since then—twelve in all—we have merely interrupted the transfusion long enough to permit complete recovery from the reaction and to check the cross-matching. In all cases the readministration of blood to a total of about 500 c.cm. proceeded without event.

The following table summarizes the essential details of the cases:

Case	Age	Sex	Group	Amount of Blood before Reaction	Interval between Transfusion
				c.cm.	hours
1	18	M	B (III)	150	5½
2	55	M	B	25	3½
3	18	M	B	70	15
4	28	M	B	70	3
5	27	M	B	400	5
6	22	M	B	350	21
7	17	M	B	200	5½
8	10	M	B	120	5½
9	28	M	B	150	22
10	35	M	B	150	7½
11	3½	M	O (IV)	70	22
12	37	M	B	250	8

CONCLUSIONS

We can find in the literature no satisfactory explanation for the non-haemolytic reactions—that is, where, as here, fresh blood is used. Impurities in the rubber tubing, particles of old blood left in the needle, the use of blood from a donor in the post-prandial period, are among some of the explanations given. Such reasons seem inadequate, for we do not observe reactions from saline and glucose injections when the same apparatus as that used for blood transfusions is employed, and our blood donors were all drawn from the local prison, where the rule prohibiting the taking of food before the giving of blood is strictly enforced.

The symptoms of this type of reaction to blood transfusion are certainly very similar to those of anaphylactic shock in general. And our finding that soon after recovery the transfusion could be resumed without response suggests to us that these reactions are indeed anaphylactic in nature. Accordingly, *the reaction is to be considered a process of desensitization.* We do not venture to guess the nature of the antigenic substance.

Of the twelve cases reported, eleven belonged to Group B (III), and all the patients were males. (Our patients are limited to this sex entirely.) The predominance of Group B in the transfusion reactions here seems to be only a coincidence. Five Group B patients not mentioned had no reaction at all to transfusion. There have been reactions of this kind in only two cases belonging to Group O (IV), one of which is reported here (Case 11). In the other case a direct transfusion was given and was not repeated, so no mention of it is made above.

The practical importance of this phenomenon is self-evident. Blood which has caused such reactions need not be discarded, our experience showing that after checking the cross-agglutination the transfusion may be resumed safely soon after the recipient has recovered from the reaction.

We are indebted to Dr. C. M. Van Allen, chief surgeon of the Bikaner State Hospital, for his guidance and kind criticism.

J. J. WOLFE, M.D.
C. E. DAS GUPTA, L.C.P.S.
Bikaner State Hospital.
Bikaner, Rajputana.

M. J. Reuter and R. Nomland (*Wisconsin med. J.*, 1941, **40**, 196), who record three personal cases in women aged 52, 56, and 72, state that cutaneous metastatic cancer may be associated with inflammatory signs. The clinical features are closely allied to the inflammation of erysipelas, but there is no chill, fever, prostration, or leucocytosis. The diagnosis is difficult and a biopsy is usually required. As inflammatory metastatic carcinoma secondary to primary cancer of the breast is common, any inflammatory lesion of the skin of or about the breast which does not subside in two or three weeks warrants a biopsy for diagnosis. Histologically the inflammatory signs are due to extensive lymphatic blockage by cancer cells which causes oedema.

Reviews

PLANNING FOR HEALTH

National Health Services and Preventive Methods for Improving National Health. By Dame Janet Campbell, M.D., and H. M. Vernon, M.D. (Pp. 46. 9d.) London: British Association for Labour Legislation.

In his introduction to this pamphlet of the British Association for Labour Legislation its chairman, Mr. H. Graham White, M.P., says: "We must prepare for a real extension of national health insurance (including dependants of the insured), a reorganization of our hospital system, and a change in the position of the medical profession in the community." As to the first two of these aims there is a considerable measure of agreement; what the third means is not at all clear. In the first of his *Collected Addresses* the late Wilfred Trotter, comparing the profession of medicine with those of the Church and the Law, describes it as having, unlike them, "had no direct influence in the work of government. It has therefore had to submit to its duties being piled up as occasion arose with no resource for securing a due compensation of privilege and immunity. . . . The result is that it finds itself of all professions the least in command of social prestige, the least privileged, the most exposed, and the hardest worked. I do not think it is to be deplored. It has put medicine in the very small class of professions in which it is possible for men and women to pursue the dying ideal that an occupation for adults should allow of intellectual freedom, should give character as much chance as cleverness, and should be subject to the tonic of difficulty and the spice of danger." A profession of which this could be said by one of the wisest of its members may well be watchful of proposals ostensibly intended to change its position in the community; and his statement affords criteria by which the desirability of any profound changes may well be tested.

The pamphlet under review is definitely designed to promote some such changes. It is not a joint production of its authors in the ordinary sense, but consists of two independent essays—one by Dame Janet Campbell on "National Health Services," the other by Dr. H. M. Vernon on "Preventive Methods for Improving National Health." The latter is a useful contribution, setting out clearly a number of facts relative to social and industrial health, and showing that "there are at our disposal many simple preventive measures, not dependent on medical aid, which, if adopted, will cause a considerable rise in the average standard of health and physique in the nation." The facts will probably be familiar to a majority of readers, but it is to be hoped that there will be others to whom they will afford a fresh stimulus to action. Two opinions expressed are particularly noteworthy: that "occupational environment is not nearly so important a factor in controlling the health of the nation as social environment"; and that "of all the social conditions met with in the home maternal care comes next in importance to nutrition and counts for more than the standard of the housing." If to these be added a third—that every responsible individual can largely determine his own environment—we have some valuable guides towards reform.

Dame Janet Campbell's essay has a more direct bearing upon the position of the medical profession. Here again the facts of the situation are set out clearly, though they are now quite familiar to most readers. So are the defects of the present medical provision. But in this connexion the author is not quite accurate or fair. She underestimates both the curative and preventive work of the general practitioner, though admitting his potentialities for good; and it

is both inadequate and misleading to say of insurance practice that "its scope is strictly limited and confined in the main to minor diseases, many of which are treated at the surgery with a bottle of medicine. . . . The hurried work of the busy private surgery makes it impracticable for the most conscientious doctor to give the full time and attention needed by many of his patients." It is evidently difficult for one whose main professional work has been that of a departmental official to envisage the actual extent and efficiency of the work of general practitioners as a class.

The main change advocated by Dame Janet Campbell is apparently the general establishment of "health centres" where practitioners, all on a whole-time salaried basis as officers of the local authority or central department, would be jointly responsible for medical attendance, an attempt being made to maintain an individual relationship between doctor and patient so far as possible. There may be densely populated and very poor urban areas where such an arrangement would prove convenient and help the amenities of medical residence and practice; but, even so, why the whole-time salaried basis of remuneration? And are not areas of this character to be eliminated after the war? A little reflection must show that such an arrangement would be unnecessary, inconvenient, unacceptable, or quite impracticable in most residential and in almost all rural areas. Moreover, it would inevitably alter the traditional relationship between patient and doctor. The atmosphere of the consulting-room would tend to change from that of a purely private, confidential, friendly interview to that of a less sympathetic investigation by a public official sharing his duties with others and having only a minor interest in the individual. There is no hint in the pamphlet that there are other solutions, but it is to be hoped that all who read it will not be content without a wider knowledge of these.

H. B. B.

STATISTICAL LITERATURE

The Second Yearbook of Research and Statistical Methodology. Books and Reviews. Edited by Oscar Krisen Buros. (Pp. 344. $5.00.) New Jersey: The Gyphon Press. 1941.

The primary object of this handsome volume is to help students and teachers of statistics to discriminate between good and bad statistical books. To that end the editor has reprinted reviews of statistical books published in one or more of 283 American or British journals. The books reviewed are arranged alphabetically by author's name and cover a wide field—elementary textbooks, volumes of mathematical tables, monographs, and books like Prof. Bernal's *The Social Function of Science*, which deals with social relations. A subject index enables the reader to turn to the reviews of books on topics in which he is interested. We have no doubt that any statistician would find this volume interesting and instructive, and not much doubt that, if those for whom it is designed would use it, they would learn a good deal, although, as the editor points out, the reviews vary in competence and a beginner can hardly discriminate between competent and incompetent criticisms.

The aim of the editor is praiseworthy, but we doubt whether the scale is not too large. The reviews, although restricted to books written in or translated into English, cover more than 350 large pages. It might be better to restrict the connotation of the term "statistical" more narrowly (it is, for instance, hard to see what on earth Mr. Otto Eisenschimi's paper on the alleged crimes of historical critics, a review of which occupies almost a page, has to do with statistics, however defined) and to select the reviews printed. We realize the difficulty of this. If, for instance, one printed the reviews of a book intended for medical readers which appeared in medical journals and no others, some important criticism by a mathematical writer might be lost. But an editorial committee should be able to guard against that risk and, without quite drastic curtailment, the undertaking will, we think, prove beyond human powers.

TECHNIQUE FOR THE THEATRE

Instruments, Appliances, and Theatre Technique. By Evelyn Pearce, Senior Sister Tutor, Middlesex Hospital. (Pp. 226; illustrated. 6s. net.) London: Faber and Faber, Ltd. 1941.

Instruments, Appliances, and Theatre Technique is the title of a small, well-illustrated book by Miss Evelyn Pearce, who has already written several textbooks which have made her name well known to the members of the nursing profession. Her latest work has been produced to meet a demand on the part of those engaged in teaching and training probationer nurses, assistant nurses, nursing auxiliaries, and orderlies in hospitals both in this country and with our Forces over-seas. As Miss Pearce tells us, the instruments employed in surgery are numerous and many are highly specialized, so that too wide a field could not be covered. Nevertheless the field so covered is a fairly representative one and well up to date, and includes examples of recent types of blood transfusion apparatus. Some obsolete appliances could, with advantage, be omitted from a second edition, particularly Cline's, Neville's, and Marshall's ham splint, Liston's knee splint, and the jointed arm and hollowed, angular, wooden arm splints. There is nothing to be gained by overloading the minds of tired nurses with the names and details of such pieces of apparatus, which are at present merely of historical interest. The same remark applies to certain little-used instruments such as Mosley's fascia forceps, Liston's naevus needle, Doyen's needle, etc. On the whole, however, the selection of material, always a difficult matter in a book such as this, has been good. Special apparatus for ear, nose, and throat and ophthalmic surgery, anaesthesia, lumbar puncture, etc., is included. The text is adequate, well printed, and clear, the illustrations are good, and the book is of convenient size. It should have a wide appeal to all who may be called upon to form part of the team of an operating theatre here or abroad, in civil life or in the Services. As a guide to such it can be strongly recommended. Miss Pearce is to be congratulated on thus providing for the needs of a large number who are in training at present and who will in time be succeeded by numerous others.

PLASTIC SURGERY

Chirurgie Réparatrice et Correctrice des Téguments et des Formes. By L. Dufourmentel. (Pp. 408; illustrated; paper cover. $3.00.) Paris: Masson et Cie.

The author was a pupil of Prof. Pierre Sebileau, who contributes a preface to this work, and was one of the most active of the French plastic surgeons during and after the war of 1914-18. He defines "reparative surgery" as the art of reconstituting tissues or organs which are missing or have been accidentally destroyed, while "corrective surgery" is the art of giving a normal aspect to malformed or accidentally deformed organs. The author points out that these terms must necessarily overlap to some extent. The first chapters are devoted to general methods, among which is included a section on emergency plastic surgery. The contents of the other chapters are well indicated by their titles: corrective surgery of the skin, reparative surgery of the skin, corrective surgery of the nose, reparative surgery of the nose, fronto-orbital reparative surgery, corrective surgery of the maxillae, reparative surgery of the maxillae, corrective surgery of the auricle, reparative surgery of the auricle, treatment of hare-lip, corrective surgery of the breast, reparative surgery of

the breast, and plastic surgery of other regions. As would be expected, particular attention is given to the technique of facial surgery.

The book is well printed and illustrated, appears to be fully documented, and is of interest as the fruit of twenty-five years of practice by a leading French exponent of the art of plastic surgery.

Notes on Books

In welcoming the first edition of E. B. SPAETH'S *Principles and Practice of Ophthalmic Surgery* attention was drawn to the fact that this is an exposition of the surgical pathology of the eye as well as a textbook on operative surgery, and that a number of procedures advocated by the author were not widely practised in this country. The new edition (Kimpton, 48s.) retains the character of the original text, and the individuality of the book is rather more obvious than before. It has now become an imposing tome, and, while little fault can be found with the exposition as a whole, there is still room, as was pointed out in our previous review, for the elimination of redundancy. Of topical interest are the excellent chapters on plastic surgery. This is a field to which the author has contributed extensively, and his guidance towards the principles underlying modern plastic surgery is of great help to procedures with which most ophthalmologists are relatively but little acquainted. The illustrations are well chosen, though more use could perhaps be made of sketches indicating steps to be followed. Such sketches are of greater help to the operating surgeon than photographs showing the initial and end stages seen in particular patients. In spite of minor defects the present volume is likely to establish itself as a standard work in English on the surgery of the eye.

The original edition of J. G. CROWTHER'S *British Scientists of the Nineteenth Century* came out in 1935 and contained descriptions of the discoveries and the life histories of Sir Humphry Davy, Michael Faraday, James Prescott Joule, Lord Kelvin (William Thomson), and James Clerk Maxwell. It was commended in these columns for the author's vivid character sketches and the very complete enumeration and description of the discoveries of the five physicists which formed the main part of his book. The work has now been republished in two small volumes of the sixpenny Pelican series. Vol. I comprises Davy, Faraday, and Joule; vol. II the lives of Kelvin and Clerk Maxwell, and also a life of William Henry Perkin, specially written for this edition. Perkin was the creator of modern chemical industry, which has so profoundly influenced the destiny of nations. It was in 1856 that Perkin began, at the age of 18, the systematic invention of new dyes from substances without dyeing properties. It led to the invention of new drugs, perfumes, flavouring matters, textiles, explosives, and other additions to human means. The industry he created was imitated in Germany and brought to such a pitch there that it has become the core of the scientific part of the German war effort. Mr. Crowther examines Perkin's work in relation to his own character and social environment, in order to throw light on why the growth of chemistry has been so different in Britain and Germany and to illustrate some of the scientific factors that have become an essential part in the power of modern nations.

To be faced with 320 pages on *Worry in Women* in close print on poor paper was daunting to the reviewer. But AMBER BLANCO WHITE early engages one's sympathy by her confession that the book has been extremely difficult to write. She hoped to help women to deal with their tendency to worry. First her book was too anecdotal; then too theoretical. This is the third draft. Unfortunately one has to own that it still attempts too much. Mrs. White shows her wide knowledge of women's mental processes, but the causes of illegitimate worry are inadequately differentiated from those of serious origin. She looks at worry in a sympathetic, friendly spirit through confessedly Freudian spectacles. Practical common sense based on psychological instruction is the method of help. Feelings of guilt and inferiority are faithfully dealt with; morality seems to be represented as purely human, and wisdom to be within the limits of self-knowledge. Worry connected with husbands and children is treated thoughtfully but, probably in an effort to meet too many cases, with confusing fullness. The book is a sincere effort to treat the disease of worrying; for greater accuracy of aim, suppression and subdivision are suggested. It is published by Gollancz at 12s. 6d.

The Year Book of the Royal Society of Tropical Medicine and Hygiene for the year 1942 has now been issued from Manson House, 26, Portland Place, W.1, at 5s. It gives full information about the work and personnel of the Society, which during the war has still managed to publish the usual six numbers of its *Transactions*. In view of war conditions and the number of Fellows on active service, it was decided to postpone the election, due this year, of a new Council and officers; and that the President, Sir Rickard Christophers, the vice-presidents, council, and officers elected in 1939 should be asked to remain in office for the time being.

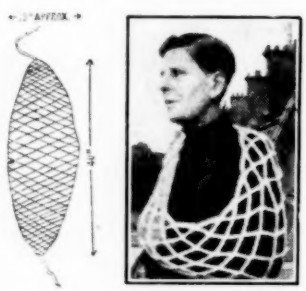
In our notice of the second edition of Miss K. C. Clark's *Positioning in Radiography* (November 8, p. 654) we erroneously stated that the number of illustrations is the same as in the first edition. In all 125 new illustrations have been added, though this is rather disguised by the fact that Messrs. Ilford Ltd. have retained the original numbers, making the additional figures *a, b, c,* as the case might be.

Preparations and Appliances

A SELF-FITTING SLING

Miss M. M. BATE (a member of the St. John Ambulance Brigade No. 9 Nursing Division, and Instructor at two gas cleansing stations) writes:

The sling here described and illustrated has been designed and made with a view to its use primarily for cases of injury to the upper limb in gas-contaminated casualties. It is made of a strong soft cotton yarn, skilfully designed to take a limb comfortably, and at the same time allows free access to the skin for gas cleansing purposes. It will stand up to washing and boiling. The details of construction are as follows:



The "self-fitting sling" is made of cotton yarn, or other soft material which may be crocheted. It is hammock-shaped and in the form of a wide mesh, and is so constructed that it adapts itself to any position of the arm. This result is obtained because the centre part is made of the largest mesh, decreasing gradually towards the ends. A decrease in stitches at the edges, in the middle of the sling, in relation to the increase in the centre, brings about the snug fit which supports the arm and keeps it in position, and also causes the edges to be strengthened by what amounts to a double line when taut.

It is primarily intended for use in gas cleansing stations for those who, in addition to being contaminated, have received injuries necessitating the support of the upper limb. The sling can also take the place of a large or small arm sling or a St. John sling in circumstance of injury where no gas contamination exists. The special advantages are (1) simplicity, (2) speed of adjustment, and (3) the mesh allows the injured part to be cleansed with soap and water in contaminated cases while the sling is on.

The design has obtained a provisional patent. It is to be hoped that the sling could be widely adopted, as it is easy to make, cheap, and can be utilized in other ways than for gas cleansing stations.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY DECEMBER 6 1941

ROUTE OF INFECTION IN POLIOMYELITIS

The occurrence of an outbreak of poliomyelitis in Berkshire, the closing of schools, and the barring of children from cinemas are all facts which serve to emphasize how little is actually known about the disease, despite the intensive studies of the past thirty years. Why should poliomyelitis be rare in Great Britain? It is common enough in the Scandinavian countries, in Canada and the U.S.A., and, at the other end of the world, in Australia. Is the disease transmitted as a droplet infection? If it is, then why should its greatest prevalence be in the summer and autumn months when other droplet infections are at their lowest ebb? Is the disease transmitted by infected food or water? If it is, then our efforts should be directed to a study of fingers, faeces, food, and flies, and to a discovery of possible carriers. If poliomyelitis is akin to dysentery or typhoid, it is curious that Egypt and the Middle East are untroubled by epidemics of the disease, despite the fact that the earliest indication of poliomyelitis is to be found in Egypt on a stela of the Nineteenth or Twentieth Dynasty, about 1300-1200 B.C.

An effort to solve some of these conundrums has now been made by Toomey.[1] By correlating pathological changes and clinical symptoms in man he attempts to reach definite conclusions about the portal of entry of the virus into the human body, and, as a corollary, to lay down the steps necessary to prevent the spread of the disease. Toomey's arguments may be briefly summarized. It is taken as axiomatic that the cerebral cortex is not a favourable site for either the development or preservation of the virus; nevertheless, as the name poliomyelitis (πολιός, grey) implies, the virus has an almost obligate affinity for the grey matter of the cord. Bodian and Howe,[2] in fact, suggest that the virus is not only neurotropic in that it has a predilection for nervous tissues, but is neuronotropic in that it has a selective affinity for, and probably is dependent for its growth upon, living nerve cells of certain types. To reach the nerve cells the virus must establish contact with axis cylinders by means of which it passes from the exterior of the body, from the skin or mucous membrane. In the skin, however, the non-medullated nerve endings are protected from the exterior by a thickened horny layer, with the result, as might be expected, that intact and untraumatized skin is experimentally a poor portal of entry, though when the virus is injected intradermally infection readily develops. A flap cut in the skin of an experimental animal, no less than the extraction of a tooth or the removal of a tonsil in man, provides a field where virus and non-medullated nerve endings can meet and hence where infection can occur.

There are, however, certain regions in the body where the same thing can take place apart from trauma—the olfactory mucosa, around the taste buds in the tongue, the tonsillo-pharyngeal area, the intestinal mucosa, and possibly the bladder wall and the respiratory tract. Can any of these portals of entry be correlated with the fact that in man the paralyses are usually segmental in type and in most cases involve the lumbar, cervical, and bulbar enlargements in the order named, pathological changes being practically restricted to these areas? Up to a short time ago attention was focused on the olfactory tract as the most important, if not the sole, portal of entry of the virus. It was always difficult, however, to explain the presence in man of extensive lesions in the lumbar and few or no changes in the bulbar and cervical enlargements if the virus entered by the olfactory mucosa. Entry by this portal fails also to explain the rarity of lesions in the thalamus, even in those who die with bulbar symptoms, or the lack of definite signs of involvement of the spino-thalamic tract, which carries pain and temperature sense fibres in the lateral column and touch and pressure sense fibres in the ventral branch. When in rhesus monkeys the first and thirteenth cranial nerves are disconnected from the brain and virus is injected intravenously the animals still develop the disease, thus showing that an intact olfactory tract is not essential for the production of poliomyelitis. Finally, in human post-mortem material there is no evidence of pathological involvement of the olfactory bulbs. Clinical and pathological evidence in man, as well as experimental evidence in monkeys, thus gives no support to the view that the olfactory mucosa is the normal portal of entry of the virus.

What evidence, on the other hand, can be brought forward in favour of the gastro-intestinal tract as the portal of entry, a view put forward as long ago as 1907 by Harbitz and Scheel[3]? In the gastro-intestinal tract there is no thick epidermal layer, as there is in the skin, and virus should thus have no difficulty in coming into contact with non-medullated fibres of the sympathetic and parasympathetic nervous system, provided there is sufficient time for absorption. When the virus is placed in the intestine of the rhesus monkey poliomyelitis does not occur, probably because virus is swept through the intestine by rapid peristalsis. If, however, the intestines are mechanically dilated the disease is easily produced, the paralysis being segmental, as in man. This is presumably because the virus has time to come in contact with non-medullated nerves and to be absorbed by axis fibres. The exact route by which the virus passes from the intestine to the cord in man is, however, not quite clear: for Toomey it is by way of the sympathetic fibres and the somatic nerves of those segments lacking white rami communicantes: it would thus first reach the lumbar cord, and (as is well known) the lower extremities in man are usually first affected. With greater susceptibility on the part of the patient, or a more poisonous strain of virus, there might be spread along the sympathetic collateral chain to the other segments that lack white rami communicantes—in other words the cervical area. In this connexion Howe and Bodian[4] have found that after transection of

[1] *J. Pediat.*, 1941, **19**, 103.
[2] *Johns Hopk. Hosp. Bull.*, 1941, **68**, 58.
[3] *Dtsch. med. Wschr.*, 1907, **33**, 1992.
[4] *Johns Hopk. Hosp. Bull.*, 1941, **69**, 86.

the cord in monkeys the virus may pass from the cord via the sympathetic fibres to the paravertebral chains and, after ascending in them, re-enter the cord; or in the absence of intact sympathetic chains it may continue to the wall of the gut, where in Meissner's and Auerbach's plexuses it comes into contact with the preganglionic fibres of the vagus and ascends to the brain. The isolation of virus from the coeliac ganglion of one patient with bulbar symptoms by Sabin and Ward,[5] and from two other patients by Toomey, strongly suggests the sympathetic nerves as a route for infection; but the evidence is not entirely conclusive, for lesions in the coeliac ganglia of chimpanzees have been found in instances where the primary point of infection is known to have been the olfactory bulbs (Howe and Bodian[6]). Physiological considerations are thought by Toomey[1] to suggest absorption from the alimentary tract, for the reflex changes seen in early cases of poliomyelitis in man are very like those in typhoid. Experimentally poliomyelitis can be transmitted to *Cercopithecus* monkeys by feeding, and has been produced in the chimpanzee by way of the gastro-intestinal tract, while in man the virus has been isolated from the faeces and in epidemic areas from the sewage. Epidemiologically Aycock and Eaton[4] have shown that the peak of incidence of poliomyelitis occurs at the same time as that of typhoid. Further evidence of the similarity of poliomyelitis and typhoid is to be found in the isolation of poliomyelitis virus from flies caught in the neighbourhood of infected cases in Connecticut and Alabama by Paul, Trask, Bishop, Melnick, and Casey.[7] The exact species in which the virus was present is uncertain, for the injections into monkeys were made with a mixed bag of greenbottle flies, *Lucilia sericata, L. caesar,* and *L. sylvarum,* together with the blow-fly *Phormia regina,* the house-fly *Musca domestica,* and a few *Muscina stabulans, Sarcophaga haemorrhoidalis, Ophyra leucostoma, Protocalliphora,* and *Stomoxys.* These findings thus confirm experiments made some years ago, when Flexner and Clark[8] showed that house-flies contaminated artificially will carry the virus of poliomyelitis for several days, while occasional attempts to transmit the experimental disease by the stable-fly *Stomoxys calcitrans* were also successful. Thus the combined evidence suggests that the gastro-intestinal is the most common portal of entry of the poliomyelitis virus. Toomey, however, argues that the virus is not the only factor in the pathogenesis of poliomyelitis in man, but that certain toxins formed in the gastro-intestinal tract act synergically with the virus.

Many workers, brought up on the theory that poliomyelitis arises by infection through the olfactory tract, may not agree with all Toomey's *obiter dicta*; nevertheless, experiments in which the olfactory or intracerebral areas have been used as portals of entry must obviously be repeated with the gastro-intestinal tract as point of entry. The question of the portal of entry is not purely academic: the evidence already available is sufficient to warrant an extension of the public health measures against poliomyelitis. In the past efforts to control poliomyelitis as if it were a droplet infection have not been too successful; in the future it would be well to investigate and control each epidemic of the disease as if it were an outbreak of typhoid rather than of influenza.

[5] *J. Bact.*, 1941, **41**, 49.
[6] *Johns Hopk. Hosp. Bull.*, 1941, **69**, 149.
[7] *Science*, 1941, **94**, 395.
[8] *J. Amer. med. Ass.*, 1911, **56**, 1717.

REHABILITATION OF THE INJURED

A comprehensive national service for the rehabilitation of the injured must achieve two main objectives: first, it must ensure the maximum possible physical rehabilitation of every case; and, secondly, it must ensure that those who on reaching this stage are still unfit to return to their former jobs can be retrained and settled in some alternative work suited to their residual disabilities. Of these measures the first is undoubtedly of greater urgency and importance, for on its success or failure will depend the need for the second. This has been proved by the work of the Miners' Rehabilitation Centre at Berry Hill Hall in the Midland coalfield. This centre deals only with the most difficult and resistant cases from a number of organized fracture clinics over a very wide area, yet 95% of the patients are successfully reinstated in their industry, which is one of the hardest in the world, by physical rehabilitation alone.

The Ministry of Labour and National Service has recently announced a scheme for the retraining and settlement of disabled persons, so it is opportune to consider this in relation to the schemes already inaugurated by the Ministry of Health for the earlier treatment of these cases. Undoubtedly fractures constitute the most fertile single source of permanent disability; great importance hence attaches to the E.M.S. organization for dealing with these cases. The original scheme provided for eighteen orthopaedic centres to which certain difficult cases were to be transferred, but neglected to take into account the important fact that the treatment carried out before transfer is practicable usually determines the whole future of the case. For example, in compound fractures the most important single step in the whole treatment—excision of the wound, reduction, and closed plaster—must be carried out at the earliest possible moment. Under the original scheme there was plenty of organization for dealing with the complications resulting from bad initial treatment, but no organization for preventing such complications. It seemed almost as if, having prepared for the worst, we were determined not to interfere with a steady supply of clinical material.

This system has now been supplemented by one which provides a wide network of hospitals possessing the requisite specialized staff and equipment to deal with fractures, and distributed in such a way that every case should be assured of efficient primary treatment. Of these hospitals those in non-vulnerable areas (Class A) subsequently collect from those in adjacent vulnerable areas (Class B) all the longer-term cases, and it is therefore in these Class A fracture hospitals that the facilities for completion of physical rehabilitation must be developed. A great deal yet remains to be done in this direction; but if the scheme is made to work in practice as it appears on paper, the

orthopaedic centres should be relieved of a small army of patients suffering from the complications of inadequate primary treatment, and Mr. Bevin should be relieved of a small army of chronically disabled persons in need of retraining. But, however perfect any such organization may be, there will inevitably remain a small number who will require retraining, and the Ministry of Labour's scheme provides for these. It will be operated through local officials, attached to groups of hospitals. These officials will make contact with the patient towards the completion of his treatment, and by discussion with him and with the surgeon will arrange for a suitable course of retraining after his discharge.

The Ministry's existing schemes for training normal persons in various classes of munition work will be utilized, because much of this work is readily adaptable to disabled persons. In addition there will be special training centres for more difficult cases on the lines of the existing vocational training centres at Oswestry, Exeter, and Leatherhead, which did such valuable work for cripples in peacetime. All these training schemes will be carried out under medical supervision, and the trainees will receive adequate allowances during their period of training, which is expected in average cases to last about six months. So far as possible the training will be undertaken within daily travelling distance of the patient's own home, and this is a very important point. Many disabled persons will readily take advantage of a scheme which allows them to remain at home, but will think twice or even three times before they decide to go away into lodgings. With this in mind the Ministry has arranged for training to be undertaken in technical colleges and employers' works.

The present scheme is frankly regarded as being of an interim nature, and will be developed in the future according to experience. For the present the chief training will be for various war industries, but later on there is to be a resettlement of these persons into our permanent peacetime economy. This is a problem for the future. One of the greatest tragedies of the last war was the large army of unemployed and unemployable cripples who remained as a not always silent reproach to the politicians of those days. The two schemes discussed above show that the present Government has learned a lesson from its predecessors, and is determined that, for once, history shall not repeat itself.

WAR AND THE COMMON HEALTH: A PARADOX

Only three Presidents of the Society of Medical Officers of Health have hailed from north of the Tweed. The third of them, Sir Alexander Macgregor, medical officer of health for Glasgow, delivered his presidential address the other day. It was a comprehensive deliverance, surveying the whole field of public health service in wartime, from the standpoint of Glasgow experience but with applications to the whole of Great Britain. It is a mere commonplace now that the public health service has been subjected to immense strain: new demands have been made upon it, it has acquired previously unforeseen functions, it has widened its outlook and methods, and has gained new experience which will be of surpassing value in the post-war situation. The medical officer of health has had no release from his normal duties, which indeed have acquired a new urgency from the war; to these have been added the oversight of the new emergency services, and, as though this were not enough, post-war problems are now knocking at the door of every town and city hall in the kingdom.

Sir Alexander Macgregor was not speaking only for the West of Scotland when he said that the health of the people had been better than was expected, in spite of the many influences which might have told to the contrary—new dispositions of population, overcrowding, and the depressing effect of the black-out, to mention only three. It is true that there have been certain movements of sickness and mortality—a wave of diphtheria, for example—but these, in Sir Alexander's opinion, owe little or nothing to the war. The increased incidence of pulmonary tuberculosis, which has been causing concern in Glasgow as well as in other places, is a different story. It is possible that with the entry of large numbers of young people into employment an infection which would have been resisted in normal times has gained the upper hand. But the sharp initial rise in Glasgow in 1940 slowed down in 1941. As for the feeding of the people, Sir Alexander expressed the hope that the Ministry of Food, regarded by many people as an infliction, may continue in being after the war as an essential health service. No doubt he was thinking of it not as exercising control over imports and traders but as a means of ensuring the ideal rationing—that is to say, making available the right kind of food for those who need it most, and, above all, educating the people in dietetics. He believes that the manner in which the food situation is being handled by Lord Woolton's Ministry is making a deep impression on the attitude of the people towards the common articles of diet. What he calls a "milk psychology" has been created by the National Milk Scheme. As a Scotsman he welcomes the return of porridge to favour (but how will that be affected by the recent cut in milk supplies?) and the demand for the nutritious herring. The position with regard to health in the schools is also reassuring. School children have lost none of the physical gain that has been registered in recent years, though standards of cleanliness are still too low. Infant life has suffered from the two cold spells of the early months of 1940 and of 1941, and from the whooping-cough epidemic of a year ago. Here again the war can hardly be indicted. It is otherwise with the considerable rise in the number of deaths due to premature birth. Many of these may be of psychological origin in the pregnant woman, owing to shock and anxiety arising out of the war.

It appears obvious from such a survey as Sir Alexander Macgregor, with the background of his sixteen years' experience as medical officer of health for Great Britain's second city, gave to his society that the war has accelerated progress in the field of public health—exactly the reverse of what a superficial observer would have predicted. Perhaps after all the evils and distempers from which we at present suffer have been released from Pandora's box, the treasure lying at the bottom will be found to be an advanced public health and social medicine.

PRESERVATIVES FOR STORED BLOOD

It has hitherto been customary to assess the value of any solution as a preservative for stored red cells by *in vitro* tests; changes in osmotic fragility of the erythrocytes and the rate at which spontaneous haemolysis occurs during storage have been usually accepted as satisfactory criteria of the effect of any preservative. Dr. P. L. Mollison and Miss I. M. Young in our current issue produce strong evidence which suggests that the *in vivo* survival of the erythrocytes of stored blood after transfusion cannot be pre-

dicted from such *in vitro* tests. The result of *in vitro* tests may, indeed, be completely fallacious. They studied *in vivo* survival of stored red cells by the differential agglutination method of Ashby.[1] In brief, this consists of the transfusion of cells of Group O to a recipient of Group A. After the transfusion the recipient's blood therefore contains two types of cells—O and A. The A cells can be removed with anti-A serum and the free O cells counted. The survival rate of the transfused O cells may be estimated by counting them at intervals after the transfusion. Using this method, Mollison and Young have tested eighteen different preservatives in a series of over 100 transfusions of stored blood, to which *in vitro* tests were also applied. The *in vitro* tests used were: (1) the degree of spontaneous haemolysis; (2) the increase in haemolysis after a standard amount of shaking with glass beads; (3) fragility to hypotonic saline. With a group of preservatives which contained no glucose—that is, heparinized blood, defibrinated blood, blood stored with I.H.T., with sodium citrate, and with citrate-sucrose and citrate-dextrin mixtures—the survival rate of red cells stored for less than one week was satisfactory. Subsequently deterioration was rapid. In general, blood containing glucose survives as well as fresh blood when stored for less than fourteen days. During the third week of storage there is progressive deterioration. The best survival rate was obtained with the Rous-Turner mixture, which contains 400 c.cm. of 3.8% sodium citrate, 1,000 c.cm. of 5.4% glucose, and only 600 c.cm. of blood. This considerable dilution, leading to a plasma of low protein content, is a practical point against the use of Rous-Turner preservative under conditions when stored blood is often converted to plasma. The glucose-citrate solution used by the Medical Research Council gives adequate survival up to fourteen days, and also provides plasma with a reasonable protein content. Certain preservatives shown to have excellent *in vitro* results had disastrous survival rates. For instance, though sucrose inhibits haemolysis during storage it gave a bad survival rate. The same was true of dextrin.

A further interesting result is recorded in this paper—namely, that changes in osmotic fragility may occur. When extremely fragile cells were transfused no increase in mean corpuscular fragility was observed in the recipient's blood or in the shape of the fragility curve. Further, when the fragile red cells were put into fresh plasma *in vitro* the mean corpuscular fragility reverted to normal. The most likely explanation of this reversal in osmotic fragility is that glucose is washed out of the cells when they are placed in a solution of relatively high tonicity at room temperature. This observation again emphasizes the importance of remembering that the red cell is an extraordinarily labile object, apt to change its size, shape, and characteristics rapidly. It must not be regarded, as is often done, as unchanging. It is clear from this interesting study that no preservative solution for red cells should be recommended until its effect upon the subsequent *in vivo* survival of the erythrocytes has been determined.

[1] *J. exp. Med.*, 1919, **29**, 267.

RADIUM THERAPY IN WARTIME

A pamphlet on air-raid precautions to be taken by holders and users of radium was recently issued by the Ministry of Home Security in conjunction with the Ministry of Health to county councils and county borough councils for circulation to those concerned.[2] The Commission wishes to re-emphasize that the object of the precautions (which are those it considers necessary) is not to restrict but to promote the use of radium under conditions of reasonable safety. It is an urgent necessity that radium therapy should be resumed and increased by recognized centres throughout the country, so that all patients in need of this treatment can obtain it under safe conditions with the least possible delay. The Commission therefore hopes to hear from national and regional radium centres that they have now made arrangements to put into full use the whole of the national radium on loan to them. If any centre finds itself unable to do this, the Commission should be informed, so that the radium may be withdrawn and issued to other institutions where it may be needed. It has been decided that all national radium containers requiring return to the National Physical Laboratory, for repair or any other purpose, must be brought by a representative of the centre to the Commission office at Westminster Hospital, due notice having been given, as at present, to the National Physical Laboratory and the office secretary. Detailed instructions as to procedure have been given to the responsible authorities.

[2] See *British Medical Journal*, Nov. 8, 1941, p. 678.

LUNGWORMS AND THE SWINE INFLUENZA VIRUS

When asked where flies go in the winter-time the biologist should be able to give a reasonably complete answer; the medical man, if asked where influenza viruses go when they are not producing influenza, would find it hard to know what to reply. Shope,[1] however, has now brought forward evidence to show at least where the swine influenza virus goes when it is not actually giving the pig influenza. In order to induce swine influenza it is necessary, it will be remembered, to inject the pig not only with the swine influenza virus but also with the bacillus *Haemophilus influenzae suis*. Of the two agents which thus act in concert to cause the clinical disease the bacterial component is capable, on injection, of eliciting an immune response that affords only partial protection against the disease. A swine influenza virus vaccine, on the other hand, confers a complete immunity to swine influenza. In the course of further experiments on the effect of multiple injections of *H. influenzae suis* in pigs a curious phenomenon came to light. Apparently normal pigs which had been given three injections of killed bacilli showed a mild febrile reaction exactly like that which follows infection with the swine influenza virus. After three injections of the living bacilli the pigs developed a disease exactly like that resulting from infection with both the components necessary to induce the clinical symptoms of typical swine influenza. The most likely explanation of the phenomenon seemed to be that the pigs, though apparently healthy and susceptible to swine influenza, harboured the virus in some unknown manner. Various experiments eventually showed that the swine lungworm can serve as an intermediate host in transmitting swine influenza virus to pigs. The virus is, however, present in a masked non-infective form in the lungworm, and to induce infection the virus must be rendered active by the application of a provocative stimulus to the swine it infests. Multiple intramuscular injections of *H. influenzae suis* furnish such a means of provoking infection. Swine influenza infections can be provoked in properly prepared swine during the autumn, winter, and spring. Although the phenomenon is not regularly reproducible, it occurs in well over half the experiments conducted in other seasons than the summer. Why the summer should be a refractory period is at present unexplained. The virus, it seems, can persist in its lungworm intermediate host for at least two years. Swine infected with swine influenza virus by way of the lungworm intermediate host show a more pronounced pneumonic process in the posterior lobes of the lungs than do animals infected intranasally with virus, but the situation of the worms providing the virus will

[1] *J. exp. Med.*, 1941, **74**, 41, 49.

account for this. Occasionally, swine infested with lungworms carrying influenza virus fail to become clinically ill after injections of *H. influenzae suis*, but become immune instead. In these it is believed that lungworms containing the virus are localized outside the respiratory tract at the time of provocation.

The question naturally arises whether other viruses may not remain latent in parasitic worms. In a single experiment performed by Shope, swine lungworms failed to transmit hog cholera virus; but Stein, Lucker, Osteen, and Gochenour[2] have found that strongylus worms collected from horses suffering from infectious anaemia harbour this virus: the virus of infectious anaemia was not found in Cylicostomes or bots derived from infected horses. Whether worms play any part in the life-history of the virus of infectious anaemia of horses requires further investigation; so far the virus has not been found in either eggs or larvae in the faeces of infected horses.

[2] *J. Amer. vet. med. Ass.*, 1939, **95**, 536.

CO-OPERATIVE THERAPEUTIC RESEARCH

A group of leading manufacturers of medicinal products in this country has formed an organization for the more effective prosecution of research in their industry. It will be known as the Therapeutic Research Corporation of Great Britain Ltd., and the five constituent founder companies are Boots Pure Drug Company, Ltd., the British Drug Houses Ltd., Glaxo Laboratories Ltd., May and Baker Ltd., and the Wellcome Foundation Ltd. The registered offices for the time being are 183, Euston Road, London, N.W.1. This is not a merger or amalgamation of the companies concerned; each of them retains complete freedom of action in its special fields, and, while contributing to a new research pool, forfeits none of its special characteristics. Plans for research will be drawn up from time to time by a research panel comprising the heads of research from the several constituent companies and having power to co-opt or consult with other scientific workers when special problems arise. Products evolved as a result of research thus sponsored will be marketed and sold by the constituent companies under a common name, and in this connexion we note with approval that the Corporation undertakes to assist wherever practicable in simplifying the nomenclature of new medicinal substances. The directors of this organization are Lord Trent, chairman and managing director of Boots, Mr. C. A. Hill, chairman and managing director of British Drug Houses, Mr. H. Jephcott, managing director of Glaxo Laboratories, Mr. T. B. Maxwell, managing director of May and Baker, and Mr. T. R. G. Bennett, chairman and managing director of the Wellcome Foundation.

PREVENTION OF LIVER DAMAGE

The interventions of the surgeon are, in one respect at least, more damaging than those of a malevolent enemy: the latter affect healthy men; but the patient facing operation is, physiologically speaking, seldom at its best, either by reason of his disease or because of those antecedent conditions which produced the infirmity. Although seldom as dramatic as surgical intervention, the administration of drugs may be equally hazardous, and here, too, the risk is often increased by the poor health of the subject. Much work has been done with the object of improving this state of affairs. But whereas assessment of the effects of treatment in man is often difficult, that of the benefits of pre-therapy—that is, treatment preparatory to treatment—is doubly so, for the simple reason that in most patients therapeutic agents are seldom used in strengths sufficient to cause damage. Recourse has therefore been made to animal experiment. By this means, for instance, we have learnt almost all we know of the protection of the liver against such drugs as chloroform and arsphenamine. It is now well recognized, through the work of Ravdin and his associates[1] and Miller and Whipple,[2] that a high protein intake affords even better protection than carbohydrate, and, conversely, that depletion of body protein predisposes to liver damage by these drugs. Analysing this protective action of protein further, the latter authors[3] found that methionine and, to a lesser degree, cysteine gave a very high degree of protection, whereas other non-sulphur-containing amino-acids did not. The sulphydril group of these compounds is commonly conjugated by the liver with certain foreign substances, which are thereby "detoxified" and excreted as mercapturic acid: such, Miller and Whipple suggest, may be its action here (though in preliminary experiments no such compound has been found).

A further interesting discovery is the protective effect of the injection of various diverse substances whose only common action is that of producing an inflammatory reaction. Ravdin and his associates[4] believe that this is attributable to the increased breakdown of tissue protein which occurs with any inflammatory process. The biochemical aspects of inflammation are too little understood for it to be certain how much of this proteolysis is generalized (if any), and how much is due to the local source entirely. Menkin[5] suggests that local inflammatory proteolysis is responsible for the enhanced gluconeogenesis seen in diabetic subjects with superadded infection. It would be rashly teleological to conclude that this protective action of inflammatory proteolysis was evolved to combat the evil effects of chloroform addiction in the starved. It seems, however, at least possible that there may be other and more natural processes—for example, burns—which produce similar effects on the liver and in which this protective action may be concerned. The natural objection to the comparison of such animal experiments with similar therapeutic trauma in man is that the animal is previously healthy, whereas the patient is not; a better comparison is that pointed out above between the subjects of surgical trauma and those of enemy action. The results might, therefore, be expected to be more favourable in the animal than in the human recipient of drugs. However, from the work discussed above it is possible that the reverse may often be true, and that the subjects with infection may be in a more favourable condition to withstand further insults than those without.

[1] *J. clin. Invest.*, 1939, **18**, 277.
[2] *Amer. J. med. Sci.*, 1940, **199**, 204.
[3] Ibid., 1940, **200**, 739.
[4] *J. clin. Invest.*, 1939, **18**, 633.
[5] *Science*, 1941, **93**, 456.

A general meeting of Fellows of the Royal Society of Medicine will be held on Friday, December 12, at 2.30 p.m., when Sir Almroth Wright will read a paper on "The Need for Abandoning Much in Immunology that has been Accepted as True."

The next annual general meeting of the British Orthopaedic Association will take place in Oxford on January 2 and 3, 1942. The scientific sessions will be held in the lecture theatre of the Department of Human Anatomy at 9.30 a.m. on both days. The programme includes an address by the president, Prof. T. P. McMurray, on "Conservatism in Orthopaedic Surgery," and a paper by Prof. Philip Wilson (New York) on "Arthroplasty."

IMPRESSIONS OF A REGIMENTAL MEDICAL OFFICER

BY

R. C. L'E. BURGES, M.B.

After reading Major J. T. Robinson's article on the army medical officer (*Journal*, October 18, p. 555), it seems opportune to put on record certain impressions gained during two years as regimental medical officer to a training depot.

Having worked for twelve years in a mixed general practice, the first point to strike me forcibly was the similarity between the men attending daily sick parade and those attending the civilian surgery; the only real difference was that a soldier has to attend for minor ailments which he would not dream of reporting to his civilian doctor. This is not the soldier's fault, but is rendered necessary because of the rule which insists that no man may be excused all or part of his drills without a supporting medical certificate. It is quite unnecessary, and often not desirable, that every man who reports sick should be given a thorough physical examination. Any practitioner who has been used to busy surgeries will easily pick out those who require a detailed examination and those who can rapidly be dismissed with a placebo or, if necessary, an admonition.

An introductory address was always given to each new intake of recruits, in the course of which it was emphasized that the R.M.O. was in point of fact their panel doctor. This was invariably appreciated by the audience, 99% of whom were panel patients in civil life, and had had in the main a fair deal from their doctor. A brief description of the methods by which a soldier could see his M.O. was then given, and in order to overcome the somewhat stilted atmosphere of the daily sick parade—for which the sick were first paraded at the regimental office, then marched up to the medical inspection hut or room by the sick and defaulters orderly (an unfortunate combination of terms)—it was suggested that whenever possible men should report sick after duty. An informal sick parade was held between 5.30 and 6 p.m.; this proved very helpful in getting to know the men, and also in discovering and segregating those who had started a feverish condition during the day and who in the normal course of events would not have reported sick till the morning, thereby being in close contact with their fellow soldiers during what is probably the period of greatest infectivity.

A recruit probably makes more appearances on sick parade during his first month in the Army than during the next twelve months. This is partly due to change of environment and to the breaking in of new boots, with accompanying sore feet, but more often it is due to the results of inoculations, particularly primary vaccinations.

A satisfactory contact with the men having been made, the R.M.O. should endeavour to be equally successful in his dealings with the Commanding Officer. One point which no R.M.O. should ever forget is that he is an expert employed in an advisory capacity, and that once he has convinced his C.O., that his medical knowledge and judgment are sound, it should rarely be necessary for the A.D.M.S. to exercise more than a benevolent supervision over the medical arrangements of the regiment.

Diagnoses on sick reports should so far as possible be couched in simple language. Claw-foot and crabs mean much more to the lay mind than pes cavus or pediculosis pubis.

All cases of sickness having a direct connexion with the cooking or the sanitary arrangements of the regiment should be investigated at once; for any C.O. who notices that several cases of diarrhoea are recorded on the sick report will make immediate inquiry of the M.O., and it is obviously to the credit of the latter if he has a satisfactory answer ready.

Functional cases require a considerable amount of time and patience, and it is important that every case of neurosis should be thoroughly investigated by the R.M.O. before being sent to the psychiatrist. These cases may be divided into the following groups:

1. *Dull and Backward.*—These are usually straightforward cases; the common symptoms of headache and insomnia are brought about largely because recruits of dull mentality are unable to assimilate new technical details. These invariably obtain a C− in the F.H.3 educational test.

2. *Anxiety Neurosis and Hysteria.*—Some of these patients are dull, and the abrupt change in their lives has upset their mental balance. Often this upset is temporary, and they rapidly become normal on return to their homes and to civil employment. Others become unbalanced because of personal reasons—for example, dislike of a particular job, getting at cross-purposes with a superior, and often domestic trouble at home. It is very necessary for the M.O. to gain the confidence of these men, for it is not easy to get a soldier to tell of his unhappy personal difficulties.

There is a third group, fortunately a small one, of men who seem determined not to soldier, and ultimately it is necessary for the medical profession to decide whether these are psychopathic cases or not. In the few cases of this type that passed through my hands I was not always convinced that the recommendation for discharge made by the psychiatrist was the correct one. I have attended several informal talks between the psychiatrist and the commanding officer of a training regiment, and I know that the arguments raised by the psychiatrist have failed to convince the lay mind. It would be preferable if cases recommended for discharge were transferred to a psychological depot, where they could be kept under continuous observation before finally being boarded out of the Army.

Conclusions

A medical officer should not be posted to a regiment unless he has spent at least six months in general practice.

The preliminary R.A.M.C. course should be followed by a fortnight's duty under an experienced R.M.O., possibly in a training camp. This would help the newly joined medical officer to put into practice the theoretical knowledge he has learnt at the depot.

It is important that the R.M.O. should be a good mixer, and be respected by both officers and men. He should be fair and unbiased in his approach to the various problems that will arise.

Just as in civil life some doctors are quite unsuited to general practice, so in the R.A.M.C. there are men unsuited to regimental practice. These should, if possible, be sorted out in the initial training and be sent to other branches of the Service.

It is recognized by many A.D.sM.S. that on the efficiency of the R.M.O.s depends the health of their Divisions, and it seems a pity that it is not possible for proved experts in regimental medical duties to be granted increased responsibilities in their own sphere. The present unit of 800 to 1,000 men scarcely provides enough work for an experienced M.O., and he could look after double that number without being overworked.

The reception stations in this country give an increased chance for an R.M.O. to carry out better medical work, and every facility should be given to enable medical officers to do duty in them.

Short spells in hospital would be welcomed by all M.O.s, as would postgraduate courses arranged in conjunction with the various teaching hospitals.

According to the *Deutsche Medizinische Wochenschrift* (March 28, 1941), a new order for combating trachoma in the Eastern Territories (Poland) has been issued by the Governor-General. The order stresses the responsibility of the patient, his parent or guardian, and the doctor with regard to the disease in order to impress on the population the necessity for treating it. In co-operation with the Trachoma Research Institute in Cracow, the Children's Trachoma Hospital in Witkowitz, and a network of mobile units now to be put into operation, a start has been made to combat this disease. A special trachoma hospital has been equipped in Litzmannstadt. It is calculated that there are about 100,000 cases of trachoma in Poland.

LOUSE-BORNE TYPHUS FEVER

As briefly announced last week, the Ministry of Health has issued a note on this subject (Memo. 252/Med.) summarizing the principal facts and giving guidance on diagnosis and administrative control. The existence of louse-borne typhus fever in Europe and North Africa at the present time makes it advisable to take precautions in case the disease should reach this country through refugees, prisoners of war, or returned travellers. This memorandum deals only with the louse-borne type of typhus as it may occur in this country, but it must not be forgotten that the varieties of typhus fever carried by the tick and the flea have in the past been introduced into Great Britain. The form of typhus under consideration is carried by body lice and probably by head lice. It may occur with typical severity in a perfectly well-nourished person; mild cases may occur and are liable to be missed.

Clinical Features

Louse-borne typhus fever is an acute infectious disease lasting from twelve to sixteen days. It is characterized by a general maculo-papular rash which may become haemorrhagic and which is invariably absent from the face. Toxaemia and nervous manifestations are severe. The incubation period is usually between eight and twelve days and most commonly about ten; exceptionally it may range between five and twenty-three days. The onset is sudden, but may be preceded by malaise. Common initial symptoms are rigors, headache, pain in the limbs and back, vomiting, and epistaxis. The temperature generally rises rapidly to 103° F. or more. The patient soon develops a dull and heavy expression with flushed and congested face, swollen eyelids, and injected conjunctivae. Delirium begins very early and bronchitis is common. The tongue is furred and later tremulous, with limited power of protrusion. The patient gradually drifts into the "typhoid state," which is fully established between the third and fifth days. There may be either maniacal manifestations or mental torpor. Bronchopneumonia is a common complication. Cardiac dilatation and weakness are almost invariable and heart failure is frequent.

The rash begins on the fourth or fifth day as small red papules in the axillae, on the abdomen and chest and back, later spreading to the extremities. For a day or two the papules fade on pressure, after which they fail to do so and become dull red. They may resemble closely the eruption of typhoid fever, but in general are more numerous, and fresh crops do not appear. In some cases subcuticular lesions, which may be as large as a shilling, appear between the papules and give the effect of marbling. Ecchymoses may form upon the skin of dependent parts. In children especially the rash may be absent or may be confined to a few papules on the chest. When haemorrhagic it closely mimics that of haemorrhagic small-pox, and may be accompanied by haematemesis, haematuria, and melaena.

The temperature, after its rapid rise, remains fairly steady throughout the illness, begins to fall about the twelfth day, and returns to normal by a rapid lysis. Though some patients remain in torpor throughout, others go through a phase of nervous excitation lasting some days. The patient then either passes into a "typhoid state" or dies. The special features of this state in typhus are nightmare dreams and a tendency for the tongue to shrivel, become nearly black, tremulous, and incapable of protrusion. In the "typhoid state" the patient may succumb, or he may rapidly pass into the stage of defervescence.

Diagnosis of Typhus

Clinically the diagnosis rests on the sudden onset with high temperature; the occurrence on the fourth or fifth day of the characteristic rash, typically absent from the face; and the striking mental condition.

About the end of the first week, and often earlier, the patient's serum develops the power of agglutinating the so-called Proteus X strains (Weil-Felix reaction). Samples of blood serum should be sent (1) in the London area—to any sector pathologist of the Emergency Medical Service; (2) outside the London area—to any laboratory of the Emergency Public Health Laboratory Service, or to the bacteriological laboratory of the nearest university.

In the matter of differential diagnosis, fevers of the enteric group can be eliminated by the results of blood culture, cultures from the faeces and urine, and agglutination tests; cerebrospinal fever may be very difficult to distinguish from typhus clinically, and reliance has to be placed on the results of examination of the cerebrospinal fluid and the Weil-Felix reaction; encephalitis may be distinguished from typhus by the gradual onset, absence of rash, the paralysis, and the absence of the Weil-Felix reaction; the prodromal rashes of small-pox may resemble those of typhus, and for some time the differential diagnosis may be difficult.

Administrative Control

Typhus fever is compulsorily notifiable to the M.O.H., who must report every case immediately to the Ministry of Health. The probability being that the disease would first be introduced into the larger aggregations of population, a number of the principal towns have been asked to organize teams for dealing with an outbreak, the personnel being provided with protective clothing and offered preventive inoculation. An illustrated description of a type of protective clothing found valuable in practice is appended to the memorandum. In view of the difficulty of diagnosis the M.O.H. is advised to arrange for the services of a medical officer conversant with the disease, resort being made to the medical staff of the Ministry of Health, or, in London, to that of the L.C.C. On application to the Ministry a mobile team from the Harvard Field Hospital Unit of the American Red Cross will be available for help in diagnosis and control in any part of England and Wales. The M.O.H. should without delay go into the question of providing hospital accommodation for cases of typhus. During the admission of a patient to hospital the staff engaged are particularly exposed to the danger of contracting the disease. Precise details are given on this important matter so that all lice may be destroyed. A special ward must be set aside for typhus patients and accommodation provided for the staff at risk.

Every effort must be made to trace the origin of the infection, and all persons who may have been exposed to risk must be freed from lice and kept under surveillance for three weeks. It may be necessary to delouse heavily infested persons a second time after an interval of ten days, to ensure the destruction of lice hatched from eggs that have survived the first delousing. Lastly, where the possibility of typhus exists every effort should be made to lessen the amount of louse infestation among the population generally. Apart from known contacts a vigorous campaign of cleaning-up of infested persons should at once be undertaken by the health authority. The powers with regard to disinfestation are set out in an appendix to the memorandum.

GALLANTRY IN CIVIL DEFENCE

The award of the M.B.E. (Civil Division) to Dr. LESLIE FREDERICK WILSON, medical officer, Civil Defence First Aid Post Service, Kingston-upon-Hull, is announced in a *Supplement* to the *London Gazette* dated November 21. The announcement reads as follows: "Dr. Wilson has spared no pains in training the staff of his first-aid post, and the high standard of duty maintained by them has been largely due to his splendid example. On one occasion, when his post was isolated by fires and blocked roads, Dr. Wilson improvised temporary hospital accommodation for a number of seriously wounded patients and treated them until they could be removed by ambulance the following day. His coolness and devotion to duty during heavy raids have inspired all with whom he has come in contact."

Dr. KATHLEEN EVELYN SLANEY (Mrs. William Bullock), medical officer, Civil Defence First Aid Post Service, Southampton, has been commended for brave conduct in civil defence.

HERMAPHRODITISM: A HISTORICAL APPROACH

VICARY LECTURE BY DR. CAWADIAS

The Thomas Vicary Lecture of the Royal College of Surgeons of England was delivered before the President and Council on November 26 by Dr. A. P. CAWADIAS, whose subject was "Hermaphroditism."

Beginning with a definition of terms, Dr. Cawadias said that hermaphroditism should be taken as synonymous with intersexualism. It was a constitutional condition, or disease, characterized by the presence of male and female features in the same individual. There were three classes of hermaphrodites or intersexual beings: (1) the male hermaphrodite, the feminized man, in whom the male sex predominated; (2) the female hermaphrodite, the virilized woman, in whom the female sex predominated; and (3) the complete hermaphrodite or bisexual being, with complete sexual organs, both male and female. The textbooks notwithstanding, this last condition did not exist in humans.

The Greeks and Earlier

The ancient Eastern peoples, the Assyrians and others, imagined a bisexual deity or perfect being, a mystical image through which they tried to solve the problem of the sexes and the phenomenon of fertility. The cult of bisexual deities was taken over by the Greeks, whose bisexual deity was Hermaphroditus, but between the Greek god type of grace and charm, the harmonious blending of feminine beauty and adolescent virility, and the colossal, ugly, terrifying Oriental bisexual deities there was an immense difference.

It was during the Hellenic period that the really scientific view of human intersex began to be formed. The Greeks regarded the human being as a whole, a biological unit reacting to its environment. They observed accurately, reasoned close to the facts, and rejected all mystical and supernatural explanations. The ancient Greek physicians gave the first description of the two great classes of intersexualism. Hippocrates described both androgynoidism, or male intersex, in his "Disease of the Scyths"—what was known to-day as eunuchoid feminism—and gynandroidism, or female intersex, in his "Epidemics," and studied what was now described as the Cushing syndrome. The Greeks also described incomplete forms, *formes frustes*, of intersexualism. Aristotle pointed out the feminine nature of hypospadias, saying of such patients that they seemed to have the nature of man and woman at the same time. The male intersexualism of the Scyths was attributed by Hippocrates to the destruction of the semen through various diseases due to excessive horse-riding and their ill-considered treatment. For female intersexualism Hippocrates accepted the predominant role of ovarian dysfunction, and wrote, "We had the impression that if we could bring back the menstruation the symptoms would retrocede." Intersexualism was considered by the Greeks as a disease, a natural phenomenon, not a manifestation of divine wrath or a fitting indication for the cruelty shown by the Romans or at the Renaissance.

Succeeded by the Dark Ages

After the brilliant Greek period came the "period of fables," the dark ages of the history of intersex, beginning with Pliny in the first century, but continuing until the end of the eighteenth. Instead of accurate observations the physicians accepted tales in a remarkably uncritical spirit and persisted in superstition. The authors of this period described females turning into males; they did not accept the transformation of males into females, believing Nature to be progressive, from the imperfect to the perfect, from the female to the male. Ambroise Paré, a great surgeon but just as credulous as his contemporaries, reported the case of a "girl" who at the age of 15, on jumping over a stream, discovered to her horror male genital organs appearing at her perineum, no doubt to be explained as a case of cryptorchidism.

The greatest error of the physicians of this period was the notion of complete hermaphroditism among human beings. Some of the physicians who followed Pliny pretended to have seen such beings. In the works of Arnaud, a French surgeon established in London in the eighteenth century, there was an account of two hermaphrodites of Valencia who married each other and both became pregnant through mutual ministrations. These physicians even believed in bisexual beings capable of self-fertilization, of which there was an echo in the theory of Langerhans, who explained the genesis of testicular teratomata by postulating that an isolated ovarian element became fertilized in the testicle.

In this period hermaphrodites were maltreated as expressions of divine anger. Not only the monsters but their parents were put to death, and that as late as the seventeenth century. Even when superstition began to wane, cruelty persisted. Hermaphrodites were allowed to choose their own sex, or a sex was imposed upon them, but to that they had to adhere and were punished terribly if they used the prerogatives of a sex which was not theirs.

The Mechanistic Physiological Period

The lecturer next came to the period which, although it began with Sydenham and Harvey, centred principally in the nineteenth century. The first clinical advance in this period was the description of the two genuine classes of intersexes as introduced into science by the Greeks. This fuller and more accurate clinical study was rendered possible by John Hunter and later by Charles Darwin in their conception of primary and secondary characters, the former comprising the organs effecting reproduction, and the latter the other features characterizing sex but not involved in reproduction. Dr. Cawadias himself gave a clinical grouping of sexual features: gonadal, genital, morphological, mental, and vocal.

A second line of advance in clinical knowledge was the isolation and description of incomplete forms, *formes frustes*, of intersexualism. Masochism and travestism—the latter, in the male, a love of feminine dress and adornment—had been so described, as had certain cases of male homosexuality, and there were similar *formes frustes* in female intersexualism, a female sadistic form, and so on. The third and most recent advance in clinical study of the intersex in this period related to physiopathological forms, of which adrenal gynandroidism—a female intersexualism depending on hyperfunction or dysfunction of the adrenal cortex—was the best known.

Although this period marked distinct progress, it fell short of the Hellenic period by its acceptance of complete hermaphroditism. Klebs, who was mainly responsible for the propagation of this erroneous conception, maintained the existence of complete hermaphroditism on the ground that some individuals possessed both ovary and testicle. In all cases of "complete" hermaphroditism described even to-day the testis or the ovary was rudimentary and not functioning. Bisexualism could not be accepted on such slender evidence. Was there a normal woman who did not possess in her ovarian medulla testicular rudiments, or a normal woman who did not secrete testosterone? According to Klebs's criterion all normal women should be considered true hermaphrodites.

The lecturer next traced the rise of the study of the endocrine mechanism of intersexualism, especially through the painstaking work which began with Brown-Séquard, demonstrating the masculinizing influence of the testis through its hormone, testosterone, and the feminizing influence of the ovary through its oestrogenic hormone. Subsequent work had shown the masculinizing influence of other endocrine glands, mainly of the adrenal cortex, and the feminizing influence of the thyroid. Intersex had been shown to originate in a disturbance of balance between the opposing hormones. Speaking of endocrinotherapy in this sphere Dr. Cawadias said: "I know of no fact more capable of increasing our faith in internal medicine than the complete transformation of repulsively feminized boys into normal virile adolescents, thanks to a few hormonic injections, or the change into beautiful and complete womanhood of girls with hairy faces and bodies and thick and acne-ridden skin, thanks to oestrogenic hormone therapy." But these almost magical results certainly did not justify the orgy of glandular injections given at random, often by men ignorant of the complicated physiology of the internal secretions.

The Biological Period

Coming to the contemporary period of medicine, which he described as the biological, Dr. Cawadias said that it was

characterized by the consideration of the living being as an integrated unit. The biological thinking of Hunter and Darwin had been carried on by such physiologists as Gaskell, Sherrington, Haldane, and the "clinicians of the whole man," maintaining in medicine the Hippocratic spirit. The development of sex was now better understood, and therefore disturbances in that development resulting in intersex became clearer. It was shown how sometimes, in the normal mechanism of sex development, the sexoformic impulse was deflected at a certain stage, and development then continued according to the opposite sex. This deflection could occur at various phases; the earlier it occurred the fewer organs differentiated, and therefore the more marked was the intersex. It proceeded from two groups of factors: hereditary weakness of the genetic impulse and factors of environment, the latter including education, imitation, and social *milieu*.

Sex was not a fixed feature; it was the result of an evolution, which continued. The lower beings remained at the stage of asexualism. Later sexual characters appeared, but coexisted in the same being (namely, plants and some lower animals); later still the sexes separated, and complete unisexuality could not be conceived at this, the human, stage of evolution.

In passing, the lecturer noted one differentiation between the sexes. Feminism in men—for example, in the male castrate—was regarded as a retrogression, but certain male features acquired by women were regarded as not abnormal but as perfecting the woman. He instanced Lady Hester Stanhope, the niece of William Pitt, a mild adrenal gynandroid, whose features and build were masculine, and whose courage, behaviour, and domineering tendencies were traits associated with the male sex, and yet she was admired, and had some sentimental and even physical adventures.

The Basis of Sex

The ovary and testis were not the basis of sex, but merely manifestations or results of the initial genetic sexoformic impulse, which in human beings was either male or female and never bisexual. A female was not the appendage of her ovaries, to use Virchow's phrase, but had ovaries because she was female. A male was not male because he had testes; he had testes because he was male. There was neither absolute male nor absolute female. Every male had more or less latent female features, and vice versa. Intensification of this normal intersexualism characterized the disease hermaphroditism, and all degrees were encountered.

As intersexualism was biologically a disease of the whole individual, not merely a disease of a particular endocrine gland, any treatment must be directed to the whole constitution. Had we any right to punish an individual who showed the homosexual form of intersexualism? Theoretically we had no such right. A male homosexual of intersexual origin was in fact an intersex who wanted to be a female. On the other hand, a homosexual was a focus of infection. Such a boy at school infected others, causing sex reversal through psychological factors, and handicapping them for life. The duty of society to such persons was to cure them or to prevent them from harming others.

Finally Dr. Cawadias touched on adrenal virilism, a special problem by itself. When it was due to a tumour, the indication for operation was the tumour, not the intersexual state. When it arose as an adrenocortical hyperplasia the problem was more complex. In adult cases no demasculinizing adrenalectomy should be performed if the patient wished to remain male. But the principle of sex choice should not be pushed so far as to withhold adrenalectomy in infantile cases of adrenal virilism, for the results of the operation were so brilliant that it was not justifiable to risk for these subjects the persistence of an intersexual state which, notwithstanding the predominance of one sex, was always a handicap.

The Ministry of Health has now issued in Circular 2395B the promised list of special clinics outside the Emergency Hospital Scheme which are to function as additional Fracture Clinics "C" (*Journal*, August 23, p. 290). Instructions on the method of referring cases to these clinics are being sent to all hospitals in the E.M.S.

HOSPITALS IN THE POST-WAR WORLD

INTERNATIONAL CONFERENCE IN LONDON

An international gathering filled the Great Hall of the British Medical Association House in London on November 25 when a conference was summoned by the United Kingdom Council of the International Hospital Association to consider the position of hospitals the world over at the dawn of peace. King Haakon of Norway, the Grand-Duchess of Luxemburg, and Dr. Benes, lately President of Czechoslovakia, attended, together with the Prime Minister of the Netherlands, the Belgian Ambassador, the Ministers of Norway, Venezuela, and Colombia, and official or other representatives of Poland, Yugoslavia, Greece, Palestine, Iraq, Egypt, Abyssinia, India, and China. The British Red Cross and the St. John Ambulance Association, the American Red Cross, and the Czech and the Netherlands Red Cross sent representatives, and there was a representative of the Free French Medical Corps. The Agents-General of several Australian States were present, as well as Sir Earle Page, the envoy of the Australian Government.

The Minister of Health (Mr. Ernest Brown) and the Secretary of State for Scotland (Mr. T. Johnston) attended, as did the Chief Medical Officer (Sir Wilson Jameson) and several officers of the Ministry, the President of the Royal College of Surgeons (Sir Alfred Webb-Johnson), the Chairman of Council of the British Medical Association (Mr. H. S. Souttar), and the representatives of many other bodies concerned with medicine, hospital administration, and social welfare.

Mr. W. McADAM ECCLES, chairman of the United Kingdom Council, presided over this assembly. At the outset a message was sent to the King, expressing gratitude for the interest he and the Queen have taken in the work of hospitals and the hope that with the swift coming of peace there may be freedom to continue and foster the healing art in every hospital in the world. Before the conference ended a gracious reply was received. A cable of greeting was also sent to the President of the International Association, Dr. MacEachern of Chicago.

International Hospital Collaboration

Dr. A. T. JURASZ, dean of the Polish Medical Faculty in the University of Edinburgh, opened a debate on the collaboration which must follow the war, a collaboration which must extend to all nations prepared to work together on a basis of honesty and friendliness. He suggested a greater interchange of personnel, both lay and medical; a six-months residence in the larger hospitals for graduates of different countries on a principle of international exchange, and an extension of post-graduate teaching. Prof. J. LOEWY (Czechoslovakia) followed with the suggestion for a "Health Union" among European countries, the basis of which would be the curative resources of each country, such as mountain sunshine or medicinal springs, and the distribution of patients without regard to national boundaries. Dr. GEORGE H. H. WOO (China) repeated the description of recent hospital progress in China which he gave to the China Institute the other day. Dr. KARL EVANG (Norwegian Minister of Social Welfare) said that in his country of three million inhabitants there was one hospital bed to every hundred of population. He believed that after the war the same system of hospital provision, based on sickness insurance, would continue. Dr. E. J. BIGWOOD (chairman of the Belgian Commission for the Study of Post-war Conditions) said that the Governments of the Allied countries at present in London had already considered a plan of action, both for immediate relief after the war and also for long-term development.

Hospitals in English-speaking Countries

Mr. McADAM ECCLES introduced a discussion on the special problems of English-speaking countries. It was not too early, he said, to consider problems that would arise as soon as peace was declared. He suggested that in any area the total number of beds required for in-patient treatment and the expected number of out-patients should be computed, the approximate annual cost per bed and per out-patient ascertained, allowance being made for some kind of sinking fund for the purchase of

new equipment and future rebuilding, and then on the basis of this annual budget it would be possible to announce the amount necessary from the local community for the support of their hospitals, and he did not doubt that the money would be afforded voluntarily.

Mr. H. S. SOUTTAR referred to the sweeping away of divisions between classes of hospitals. He had been a member of the staff of a voluntary hospital, but at present he was taking charge of an L.C.C. hospital under the control of the Ministry of Health. He referred to the work of the Medical Planning Commission as a kind of "Brains Trust" to determine the character of the after-war service, but, of course, the International Hospital Association, along its own lines, had a still wider purview.

Voluntaryism and State Aid

Lord GIFFORD, who has been associated with a hospital in Sydney, said that that hospital preserved its voluntary character although 60% of its income came from the State. More than half its board were State-appointed, but once they took their seats they were indistinguishable from other members. Voluntary hospitals would ask a great deal more aid from the State, and yet he believed that they could preserve their democratic character. Sir EARLE PAGE also said that in Australia they had endeavoured to incorporate the voluntary system with the maximum amount of State aid. Sir WILLIAM GOSCHEN (London Hospital) spoke of the need for a scheme which would bring the voluntary and municipal hospitals together. Mr. CARUS WILSON (St. Bartholomew's) said that the doubts which had been expressed as to the survival of voluntary hospitals after the war were also expressed during the last war, but voluntary hospitals continued then, and they would continue now. But they must look to such organizations as the Hospital Saving Association for augmentation of their income.

Among other speakers were representatives of the British Dental Association and the Royal College of Nursing, and the discussion was closed by Dr. ANDREW DAVIDSON (Chief Medical Officer for Scotland), who said that although the Committee on Scottish Health Services found a shortage of 3,600 beds, this had been more than made up by the Emergency Hospital Service. There was also now available for the first time in Scotland a comprehensive orthopaedic scheme.

E.M.S. Hospitals

Mr. ERNEST BROWN, Minister of Health, mentioned the close relation between Great Britain and the United States in connexion with the Emergency Medical Service. The U.S.A. not only had given material help but had lent medical and nursing personnel. The E.M.S. was not designed as a pattern for future development, but it had nevertheless proved a very useful experimental ground from which lessons of long-term value had been learned. It was organized to cope with the expected casualties of war, but in practice it had assumed a shape which made possible the adaptation to war needs of all kinds of existing hospitals and services. It had yielded experience with regard to the relation of hospitals one to another which would greatly influence the peacetime situation.

A HOMESTEAD SCHEME FOR MOTHERS AND CHILDREN

The family unit is the first casualty in war. If the nucleus of the State is the family—the living unity of father, mother, and children—then by some means the family should be enabled to maintain its status and fulfil its function, in spite of the disruptions caused by the war. The family unit was the basic idea of that great social venture, the Pioneer Health Centre at Peckham, whose work is now largely suspended because so much of the population it served has migrated. But the ideas which animated the Centre go on, and some of them are ably put forward in a memorandum addressed to the Ministry of Health and other Departments over the signature of Dr. Innes Pearse, the medical director.

Dr. Pearse proposes a homestead scheme, which will provide a reasonably healthy and useful life for the wives and children of mobilized men. She wants to see the evacuated women and children introduced into a society of people like themselves, of which they would become an integral and significant part. If the family is to function the mother and child must not be separated, as they would be if the former went into one of the auxiliary services or into "munitions." Perhaps one-third of the mother's working day must be given to the young child, but the remainder could be devoted to work of national importance, most obviously food production. The running of a mixed farm and garden—a homestead—on an estate of thirty or fifty acres, of which there are many in this country, should be within the capacity of a group of twenty-five to thirty women with two-thirds of a day's work to give on the spot where they are living. Under the guidance of advisers and with the help of a nursery-school worker, the mothers in such a colony would be able to undertake useful self-supporting work on the land, they would take their turn in household duty, they and their children would live in relative safety and under optimum health conditions, and, what is of equal importance, the fathers, to their own great benefit, could rejoin them on the farm during their periods of leave. Dr. Pearse begs the Government to set up a voluntary service of young mothers with children under 5, to begin with, to be called "The Mothers' Auxiliary Yeomen Service." The health overhaul, which was another idea of the Peckham Centre, could be undertaken by a visiting doctor and nurse-laboratory attendant travelling in a motor van to each of a batch of homesteads, and they would also supervise the diet and general hygiene and assure antenatal and post-natal care and child welfare. It is not pretended that such a scheme could do more than touch the fringe of the vast evacuation problem; but it would at least provide that a certain number of women, made familiar with the land and having had their resourcefulness and initiative developed and their health reinforced, would be ready to stand with their men on the return of the latter from the war, a reconstituted family unit in wholesome surroundings, better able to meet the demands of the new world.

Local News

ENGLAND AND WALES

London's Wartime Hospital Needs

Mr. Charles M. Power, house-governor and secretary, reports that the Ministry of Health has placed at the disposal of the Westminster Hospital 100 beds at an emergency hospital near London. To these beds civilian patients are now being transferred, after initial treatment in the London wards of the hospital. Here, also, out-patient children needing operations for the removal of tonsils and adenoids are being sent. The Westminster Hospital has been able to reopen some forty beds for the accommodation of contributory middle-class patients. The Ministry of Health, at the request of the National Radium Commission, is providing a centre to contain 120 beds for patients needing radium and *x*-ray treatment. Five of the London hospitals will share the beds. It is hoped that these beds may be the means of avoiding delay which has occurred during recent months, and that the treatment of these distressing cases will not again be interrupted should air raids on London be resumed.

Emergency X-ray Service for Hospitals

A fleet of fifteen *x*-ray vans now stands ready to answer calls for assistance from hospitals enrolled in the Ministry of Health's Emergency Hospital Service. These mobile vans, fitted with the latest type of equipment, have been presented by the War Organization of the British Red Cross and Order of St. John of Jerusalem. They will be stationed at selected hospitals in London and the Provinces so that calls from any part of the country can be answered. It is not intended to use them for routine work, but they will constitute reserve sets for an emergency caused either by raid damage or by unexpected demands on

a hospital's resources. Each van generates its own current for the *x*-ray apparatus, which can be operated by cable up to 100 yards away. There is also a dark-room with films and developer. Typical purposes for which these units will be used are: in temporary breakdown of a hospital's *x*-ray service because of raid damage or the interruption of power supply; to examine cases in the wards of hospitals which have no mobile or portable apparatus; and to supplement the *x*-ray service at hospitals where, because of the large number of casualties, the normal facilities cannot cope with the demand. The vans will have women drivers, and a radiographer will be attached to each unit. The radiographer, who will be appointed by the hospital at which the mobile unit is stationed, will work in the hospital while not engaged with the unit. The Ministry of Health is anxious that full use should be made of these mobile units. Application should be made to the Hospital Officer or, in the case of the London Sectors, the Group Officer.

Tuberculosis in Lancashire

To meet the need for economy in paper, Dr. Lissant Cox, the central tuberculosis officer to the Lancashire County Council, presents for 1940 a very truncated interim report. He notes that in 1940 the new cases reported of pulmonary tuberculosis numbered 1,394, an increase of 105 over the previous year. On the other hand, the number of new cases of non-pulmonary tuberculosis was 751, or 39 less than in 1939. The death rates from tuberculosis per 1,000 of the population recorded in 1940 were as follows (the average for the five years 1935-9 is added in parentheses): pulmonary tuberculosis, 0.46 (0.44); non-pulmonary tuberculosis, 0.09 (0.09). It is good to read that Lancashire has been fortunate in respect of institutional treatment, because the sanatoria and hospitals, being small, were not commandeered for other purposes, so that treatment and isolation have been carried out without much alteration in spite of the war. Dr. Lissant Cox adds some data on the examination of recruits in connexion with the National Service (Armed Forces) Act, 1939. Since the passing of the Act to the end of October, 1940, the number of suspicious cases referred by medical boards to the county tuberculosis officers was 614. Of this number 78 were already known to the tuberculosis officers. Of the remaining 536, 27, or 5%, were found to be suffering from active tuberculosis (the sputum contained tubercle bacilli in 11); 15, or 2.7%, had quiescent lesions; and 3, or 0.5%, were patients with active disease who had received treatment for tuberculosis under another authority. The total number of recruits examined by the medical boards during this period has not been made known to Dr. Lissant Cox.

SCOTLAND

Post-war Reorganization of Hospitals

Mr. Thomas Johnston, M.P., Secretary of State for Scotland, in a recent address to members of the Scottish Advisory Committee of the Nuffield Provincial Hospitals Trust, urged the need for speed in defining Scotland's post-war hospital reorganization policy. He hoped the Trust would continue to help in propaganda for co-ordinating the voluntary and local authority hospitals and the new State-run emergency hospitals which had been created by the war. Mr. Johnston announced that the whole position was to be examined by a committee of inquiry which his Advisory Council on Post-war Problems had decided to set up as soon as possible. He said it was essential to have a vision now of how they were going to co-ordinate all the hospital services which would provide Scotland for the first time in its history with a surplus of hospital beds. One of the main tasks of the committee of inquiry would be to determine how co-ordination was to be secured and financial aid given to voluntary hospitals "without imperilling their jealously guarded autonomy." Members of the Scottish Advisory Committee of the Nuffield Trust agreed to give evidence before the committee of inquiry if required. It was also agreed to place at the disposal of the Secretary of State information which the Nuffield committee collected when examining the possibilities of regional reorganization of Scottish hospitals.

Correspondence

Radiology and Pelvic Disproportion

SIR,—Prof. Munro Kerr utters a warning against the easy assumption that *x*-ray examination now provides a lazy short cut to deciding the correct management of obstetric disproportion. I agree with his protest, and should be very sorry if recent publications have given any such impression. The radiologist who lacks obstetric experience, who has had no opportunity of studying the patient, and who cannot calculate with the components of difficult labour, is put in an impossible position when asked to pronounce, in a doubtful case, on obstetric prognosis and treatment; his position is even more difficult than it is when he is faced with a similar problem concerning a patient with a doubtful lesion in the lung. Further, there are many subtle pitfalls in the radiological diagnosis of disproportion, and I, for one, would regard with the greatest alarm any suggestion that the radiologist should reign supreme as dispenser of authority for the performance of Caesarean section.

Nevertheless, are we holding an even balance? Speaking as an obstetrician, I believe that we have been unreasonably tardy in accepting the aid of a valuable tool. It is for us to learn the real uses, and for us to read the meaning—as we can do with increasing accuracy—of the "writing on the wall."

Prof. Munro Kerr refers to a passing criticism I recently made of trial labour. This was taken from a paper dealing with the methods, clinical and radiological, by which pelvic contraction can be detected and its meaning assessed; and was intended to give point to my disapproval of the modern tendency to ignore pelvic measurements and to rely blindly on the method of trial labour for all sorts and types of foetal-pelvic disproportion. This tendency is, in my opinion, as reprehensible as is the extravagant and uncritical enthusiasm for radiological diagnosis which Munro Kerr so rightly deplores. But the careful obstetrician will make intelligent use of both methods. Trial labour achieves its greatest success in dealing with the antero-posterior brim contraction of the rickety flat pelvis. It is indeed amazing to find how extreme is the contraction that can sometimes be safely overcome by the forces of Nature. This I referred to in the paper quoted. But the benefits of trial labour are far less certain when the contraction not only affects the brim but is continued downwards through the birth canal (the simple flat and the generally contracted pelvis), or when there is a true funnel contraction of the pelvis. In such cases a very great responsibility rests on the observer, and too often in hospital practice unfair reliance is put on a relatively inexperienced house officer. Labour progress indeed takes place, but it is painfully, and sometimes dangerously, slow. Nor is the state of the cervix a safe indicator for deciding the duration of the trial, for in these cases the cervix may never reach full dilatation, and the patient, in fact, may never truly enter the second stage of labour. When, then, shall word be given that conservatism has failed and surgery must come to the rescue? When does watchful expectancy become ignorant idleness? Too often, while hesitation prevails the foetal heart stops. Too often the labour becomes so prolonged that Caesarean section is deemed unwise, and a supremely difficult foetal extraction is attempted from below; too often a damaged woman is left to reflect in sadness on the loss of her firstborn, whose sacrifice she can ill understand. This, no doubt, paints the picture at its worst and is the reflection of poor obstetric judgment. But mature experience is not a universal asset, and in the very real difficulties that arise every aid is eagerly seized.

It is precisely for the reason that prognosis varies with the type of pelvis that accurate appreciation of pelvic shape and size, and of foetal size, is of supreme importance in the management of the slighter degrees of disproportion. In doubtful cases the information given by the lateral *x*-ray picture *made during the course of trial labour* is specially useful. In my experience this has sometimes helped to decide the issue in favour of Caesarean section before the trial of labour has degenerated into a test of the endurance of foetal life. Much

oftener, however, the examination has revealed a foetal head that has already safely passed through the plane of least dimensions of that particular pelvis, and delivery from below has then been undertaken with some assurance of safety. While it would be idle to pretend that mistakes are never made, increasing experience has given increasing confidence in the value of *x*-ray findings in such circumstances.

Lastly, Munro Kerr himself states the case for *x*-ray pelvimetry and cephalometry in breech presentation. Minor degrees of disproportion can then be detected only by radiological means since the head is no longer available as "the pelvimeter of the brim." When external version has failed, and it is clear that disproportion will complicate breech delivery, Caesarean section should be the rule.—I am, etc.,

Radcliffe Infirmary, Oxford, Nov. 22. CHASSAR MOIR.

Vaccinia as a Complication of Vaccination

SIR,—I have been greatly interested in the excellent description by Dr. J. N. Turnbull (November 22, p. 751) of the case of the baby with generalized vaccinia, and having spent years in the study of vaccinia virus in the laboratory I venture to submit two suggestions in the hope that they may possibly be of use should further instances of this rare complication of vaccination occur.

The first suggestion is that, as the viruses of both vaccinia and variola are extremely susceptible to the action of potassium permanganate, which even in a dilution of 1 in 100,000 inactivates vaccinia, a wet compress soaked in permanganate solution should be applied to the vesicles. The virucidal action is inhibited by glycerin, so the latter should not be used as well. The second suggestion is that in a severe case of vaccinia such as that described by Dr. Turnbull trial should be made of convalescent serum if it can possibly be obtained. At the same time as Dr. Turnbull's case, that of a baby girl of 7 weeks, a brother of 3¼ years was vaccinated with normal result, and after the tenth day his serum would inactivate the virus; so that as the baby's condition remained good until the fourteenth day the effect of some of her brother's blood or serum might have been tried on her.

The beneficial effect of serum taken fourteen days after vaccination and injected into a case of that other rare complication of vaccination—namely, encephalitis—was dramatic in one of Lord Horder's cases at St. Bartholomew's, and others have confirmed this effect, with the result that the treatment is now generally established. The chief difficulty is to get the serum in an emergency, and a supply of it taken from young healthy adults fourteen days after vaccination and preserved after being dried ought to be available by this time for general use. This should not be beyond the scope of the Blood Transfusion Service. The Germans obtained it—subsequent to the publication of Lord Horder's case (*Lancet*, 1929, **1**, 1301)—by taking serum from probationer nurses after the eleventh day from vaccination; but from my observations the fourteenth day is better. This same serum might also benefit severe cases of small-pox.—I am, etc.,

East Molesey, Nov. 24. M. H. GORDON.

National Wheatmeal Flour?

SIR,—I wish to draw the attention of members to an Order in the Statutory Rules and Orders of the Ministry of Food. This was issued in August and remained unknown to us until brought into the light by the *Lancet* last week. It regulates the contents of what is called "national wheatmeal flour." We had, I think, all understood that this flour must contain the germ of the wheat and so supply a fair quantity of the B vitamin as well as the minerals missing from white flour; that it was a protective food. By virtue of this Order 85% extraction white flour coloured sufficiently to make it pale brown and so indistinguishable from a genuine germ-containing wheatmeal flour can be sold as national wheatmeal flour. That is the situation to-day, and as one who has been actively supporting what was understood must be a protective food, and the only cheap one, I wish to make the story a little clearer so that my disgust and alarm may be felt by others. It is not a comforting story.

When the Medical Research Council published their memorandum on national flour (*Journal*, May 31, p. 828) it was generally understood that the new wheatmeal flour was to be made according to their recommendations. This belief was strengthened when Lord Woolton made his speech to the bakers at their Leicester conference in June. He is reported to have said that on the subject of bread he had been to much trouble, that he had been "advised by the most eminent scientists in the country," and to have mentioned the Medical Research Council in this connexion; and that he had met the millers and a standard had been obtained for the production of national wheatmeal flour. As no other specification had been made public by the Ministry of Food this was regarded as pointing to the adoption of the only specification published—that of the M.R.C. Any remaining doubts were completely dispelled by Circular 2470 received from the Ministry of Health, also in June. This was sent to local authorities calling their attention to the nutritional advantages of making national wheatmeal flour available to patients and staff of hospitals, etc., in their area. It is so clear what Whitehall understood by the term "wheatmeal flour" that I quote two paragraphs.

"The Minister has been in consultation with the Minister of Food on this matter, and he is advised that national wheatmeal flour is now available to bakers. This flour contains the greater part of the germ of the wheat, with some of the finer bran, but excludes the coarser bran. It thus contains not only most of the vitamin B_1 but also most of the remainder of the vitamin B complex, as well as valuable mineral elements which are removed in producing white flour. National wheatmeal flour is therefore of high nutritional value and is particularly valuable at times when there is restriction upon the availability of other foods from which these vitamins and minerals could be obtained."

"Bread made from national wheatmeal flour should be of a pale brown colour and of a . . . texture closely similar to white bread."

This is a model of clarity; it tells in a plain and straightforward way just what they understood the new flour would contain. It gives definite and positive information about what it would supply, and is not an essay on what wheatmeal should supply. The mere fact that such a consultation had been held is evidence that this Ministry at least was fully aware of the nutritional importance of such a flour. It is also evidence of the source of their information which they felt justified their assurance—it was the Minister of Food himself.

We now know that by this Order 85% extraction white flour coloured with bran, which makes it resemble the wheatmeal described by the Ministry of Health, is what Lord Woolton had decided the country needs in these times. Are we to imagine that this was fully explained at the consultation; that, knowing this, Whitehall issued that circular? In my long experience as a grumbler at our Ministry I have never had anything like this to complain of.

Wheatmeal bread need contain no more vitamin than the white, which on account of these deficiencies it was to replace: no more of the anaemia-preventing iron or the other minerals. A miller may, of course, return all these to his wheatmeal flour, but he will only get the same price for it as he would if he sold the germ separately. What it will provide is to depend on what suits the business of the individual flour mills! So when we order wheatmeal bread we shall not know what we are getting unless we have a laboratory test made of the contents: only the miller will know.

It should be known when the Minister of Food altered his standard; whether it was after or before the meeting of the two Ministers. Was the Minister of Health advised so that he could have that circular withdrawn or altered so as to be in accordance with the facts? It is not clear why the Medical Research Council should have been mentioned at all when their advice was not to be followed: that was misleading. We should be told why their advice was rejected, for in the same speech in which he told them "the most eminent body of scientists in the country" Lord Woolton declared that there was no other body whose advice "could compare" with theirs. After that it is not understood how he can have found a still superior body to advise him and whose advice he chose to follow. We ought to be told who they were, or we may think that their superiority was not unconnected with financial considerations.

The situation is an alarming one when one thinks of how output can determine the result of the war and how much output must depend on nutrition. The disregard for the advice of scientists on this front may be of serious import. One heard at the meeting of the Nutrition Society at Cambridge that when 800 women munition workers were examined by members

of the society more than a third suffered from nutritional anaemia. Can that be without effect on output? Those who hearken to vapourings about "all being well" and "there is no malnutrition in the country" live in a world of their own. What a chance for the iron-containing wheatmeal bread could be found among those munition workers! But Lord Woolton has decided it is not necessary. When will the Ministry of Health direct matters of nutrition?—I am, etc.,

Grimsby, Nov. 24. S. W. SWINDELLS.

Red Cell Suspensions in Treatment of Anaemia

SIR,—Dr. G. E. O. Williams and Prof. T. B. Davie (November 8, p. 641) emphasize the need in certain cases to produce the maximum rise of haemoglobin using the minimal volume of blood possible. When the haemoglobin has reached 60% they advise changing to fresh blood to obtain the advantages of antibodies and active leucocytes. But they do not mention a fact that I noticed in my much more limited experience—this is, that the amount of blood necessary to raise the haemoglobin varies directly with the age of the blood; this is more marked in the toxic patients.

In their series Dr. Williams and Prof. Davie used concentrated red cells, and the cases quoted in their Table I average 36.5 c.cm. for a 1% rise in the haemoglobin. But the individual figures vary very widely, and one wonders if the average would be much better if the cells were prepared from fresher blood. These all seem to be cases in which there was enough time to warn the blood bank of the transfusion and to send a sample of the recipient's blood to cross-group with suitable donors and to return their fresh blood.

In the cases I have observed, which included those of haemorrhage, anaemias of pregnancy and puerperium, pernicious anaemia, and leukaemia, with the patients' weights varying from 7 to 11 stone, fresh defibrinated blood being used, the amount necessary to obtain a 1% rise in haemoglobin was always between 40 and 43 c.cm.: it was rarely as high as 43 c.cm. So constant was this figure—40 c.cm. for each 1% rise—that one could predict the amount of blood necessary to obtain any required rise in haemoglobin. The haemoglobin estimations were carried out eighteen to twenty-four hours after transfusion, and were always done by the same independent observer, who made the test before transfusion. If fresh citrated blood was employed and the volume of anticoagulant subtracted, then the actual amount of whole blood given was still the same for a 1% rise in the haemoglobin. With citrated blood that was a few days old, still allowing for the anticoagulant, the amount necessary to produce a rise in the haemoglobin rose steadily: seven- to ten-day-old blood being used, it rarely required less than 70 c.cm., and often as much as 90 to 100 c.cm., to obtain this 1% rise.

It seems obvious that the fresh defibrinated blood can compare very favourably with the concentrated red cells as these are prepared now: the results are more regular and the patient has the advantage of fresh antibodies, leucocytes, and red cells, with a difference in volume of only 3.5 c.cm. for each 1% rise in the haemoglobin. If concentrated cells were prepared from fresh blood it would probably require much less than 35.5 c.cm., maybe as little as 20 or 25 c.cm., for each 1% rise in haemoglobin.—I am, etc.,

Newcastle-upon-Tyne, Nov. 21. K. B. ROGERS.

Haemoglobinometry

SIR,—In his letter Dr. Robt. Campbell (November 22, p. 747) mentions his difficulty in deciding the correct method to use the Sahli instrument to estimate the haemoglobin percentage. I should like to suggest that it might be possible to overcome this difficulty by standardizing the Sahli instrument by comparison with a Haldane instrument. The exact technique used during this standardization should be carefully noted and thereafter strictly adhered to. The time which elapsed before diluting might be two minutes or forty minutes, but would be constant in every case.

I think this method would give sufficiently accurate results from "the viewpoint of the general practitioner," and would be simpler and cheaper than carrying sparklets of carbon monoxide.—I am, etc.,

Dundee, Nov. 22. A. J. E. MILLS.

Loss of Vision after Haemorrhage

SIR,—In view of Colonel H. L. Tidy's article (May 24, p. 774) and Sir James Barrett's letter (November 15, p. 711), a brief reference to the following case, which will be published in more detail later, may be of interest.

A woman aged 35 and thirty-two weeks pregnant was admitted to the Radcliffe Infirmary *in extremis* due to a most severe, concealed, accidental haemorrhage. She had suddenly lost her sight when she collapsed with pain and shock. In a brightly illuminated theatre she could recognize light from darkness, but could not distinguish the outline of anyone standing by her bed. She stated she could recognize a shadow there, but that was all. Ophthalmoscopy revealed no fundal lesion. Before a transfusion was administered oxygen was given with a B.L.B. mask and was continued for five hours. Within twelve hours vision was returning, and three days later the patient could read large type. Since then there has been a complete recovery of sight. Before this patient left hospital she was seen by Miss Ida Mann, who stated that it was probably the administration of oxygen that had saved the retina from destruction. It is possible, therefore, that the wider use of the B.L.B. mask in cases of severe haemorrhage may decrease the incidence of this rare but terrible complication.—I am, etc.,

Oxford, Nov. 19. JOHN STALLWORTHY.

Nicotinic Acid and Pellagra

SIR,—Your editorial article entitled "The Sprue Syndrome" (November 22, p. 731) contains the statement that pellagra "is curable by nicotinic acid." This statement surely requires some qualification.

It has become increasingly clear in recent years that pellagra is *not* due to the lack of a single dietary factor, as was formerly supposed, but is, in reality, a multiple deficiency syndrome. Besides the classic "three D's" of dementia, diarrhoea, and dermatitis, the "typical case" may present the following additional evidence of dietary insufficiency: (1) nutritional polyneuritis, usually (and probably erroneously) attributed to thiamin (vitamin B_1) deficiency; (2) anaemia, the cause of which is still uncertain in this condition; (3) cheilosis, angular stomatitis, and (4) vascularization of the cornea, which are currently attributed to deficiency of riboflavin; (5) folliculosis, the result either of vitamin A or vitamin C deficiency; and (6) a reduction in plasma protein, no doubt due to the aetiological factor you mention—"an unbalanced dietary deficient in protein." It is evident, therefore, that deficiencies of several dietary constituents ordinarily contribute to produce the clinical picture seen in pellagra. In fact, the only reason why it is possible to recognize pellagra as a clear-cut clinical syndrome is probably because of the uniform composition of deficient diets in those parts of the world where it occurs endemically. In other parts, including this country, where deficient diets are less uniform, certain features of pellagra are quite frequently encountered, but the full syndrome is rare.

The important question is, What part of this syndrome can be cured by nicotinic acid? Any critical clinician with experience of the condition will probably agree that this is a very difficult question to answer. The difficulty is that the average pellagrin improves remarkably on simple bed rest and good hospital care, even if the diet is so arranged that it provides no significant amount of the entire vitamin B complex. An efficient nurse, with the aid of soap and water, can often work wonders with a pellagrous dermatitis. This being the case, it is very hard to draw reliable conclusions from a therapeutic trial of nicotinic acid. However, there is now a considerable weight of evidence that it is at least effective in the relief of the gastro-intestinal manifestations of the syndrome and, perhaps, of the erythematous element of the dermatitis; but as to the psychologic changes—after four years' trial of nicotinic acid the mental hospitals of the Southern States of America are still providing for chronic pellagrins.

So far as I know there is no evidence whatsoever that nicotinic acid is in the least effective in the relief of nutritional polyneuritis, anaemia, cheilosis, angular stomatitis, corneal vascularization, folliculosis, or hypoproteinaemia, all of which are frequently encountered in the pellagra syndrome. Of course, it may be said that these changes are not a true part of the

syndrome, and are merely manifestations of other associated deficiencies. There may even be some who would wish to define pellagra as "the clinical consequence of uncomplicated nicotinic acid deficiency." Armed with this definition, it might then be true to say that nicotinic acid will cure pellagra, but the fact still remains that it will not cure pellagrins. Moreover, it would be impossible to give a clinical description of pellagra as so defined, since a pure deficiency of nicotinic acid, unassociated with any lack of other essential dietary factors, has probably never yet been seen in man. Your editorial implies that the simple administration of nicotinic acid is sufficient and adequate treatment for a case of pellagra, whereas the fact is that nothing short of a radical readjustment of the diet will result in a complete and satisfactory cure.

Your editorial also states that "the incidence of pellagra appears to depend not so much upon the lack of nicotinic acid in the diet as on the failure of the intestinal mucosa to absorb it." It is true that pellagra occasionally arises in consequence of some gastro-intestinal disease affecting digestion and absorption, but, in the common endemic disorder, the obvious inadequacy of the diet is surely a sufficient explanation of the deficiency, without calling in the additional hypothetical factor of faulty absorption.

You also state that "pernicious anaemia is often accompanied by glossitis similar to that of sprue and pellagra, and this is also amenable to nicotinic acid therapy." I am most surprised by this statement, since I had thought that all authorities on pernicious anaemia are now agreed that nicotinic acid has no effect on any feature of the glossitis in this disease.—I am, etc.,

Oxford Nutrition Survey, Nov. 22. ARNOLD P. MEIKLEJOHN.

Unusual Outbreak of Haemolytic Streptococcal Infection

SIR,—The seasonal epidemic of haemolytic streptococcal infections of the nasopharynx is upon us, and I think that the following brief report of an unusual outbreak will be of interest. Details have been sent to the Medical Research Council by the county bacteriologist, Dr. J. S. Croll, who has been extremely helpful and interested. The late Dr. Griffith, immediately before his tragic death, typed some of the strains.

On January 12 last a woman went alone to the lonely farmhouse where lived her sister and brother-in-law with their large family of children. Three days later she was delivered normally of her thirteenth child. It was discovered eventually that a few months previously she had sent some of her other children away with scarlet fever. On January 16 she developed pyrexia and later sore throat and cervical adenitis. On January 18 the road became completely blocked by snow, and for several weeks no one could approach except on foot or horseback over the fields. The house was thus isolated from all except myself and the foreman's employer. Between January 22 and February 4 three persons in the house developed typical scarlet fever and three tonsillitis without rash. Two of the latter developed nephritis, as did the parturient woman, and all of these patients were extremely ill. The scarlet fever patients were not ill and had no complications. Repeated throat swabs of all, except, curiously, the original case, gave cultures of haemolytic streptococci, Type A, Group 14. I regret now that I did not obtain a culture from the lochia.

The source of the epidemic is not important and I am not concerned with case histories or treatment. My point is this. In view of the accumulating evidence, how much longer must we wait for reform of the existing rules of treatment and notification of scarlet fever?—I am, etc.,

Barton-on-Humber, Nov. 26. T. H. KIRK.

Sulphonamides and Catgut

SIR,—I have heard the suggestion from more than one source that catgut employed for suturing wounds may have its normal rate of absorption seriously accelerated by the presence of sulphonamide powder, such as one has been using, for instance, in the abdominal wound in cases of gangrenous appendicitis. I have personally not yet found any reason for anxiety through rupture of such wounds, but I thought it would be helpful if others readers could bring forward any first-hand evidence either for or against this impression.—I am, etc.,

Bournemouth, Nov. 27. NOEL F. ADENEY.

Hemiprostatectomy

SIR,—The respect due to a surgeon of the eminence of Mr. W. Sampson Handley is enhanced when one has had the privilege of serving as his dresser, and it is therefore with some misgiving that I venture to offer any criticism of his advocacy of hemiprostatectomy (November 15, p. 681). Whilst I am in agreement with much of what he says, I feel that the general adoption of this operation even for one case in five would be a retrograde step. The figures he quotes from Thomson-Walker to support this proportion as suitable cases refer only to the intravesical projection and not to the all-important intra-urethral enlargement; and the conclusions of the same author that "the apparently normal lobe shows changes on section and microscopical examination which correspond exactly to those of the large lobe" are confirmed by the routine examination of all prostates in which both lobes are removed.

I would agree that the maintenance of continuity of the vesical and urethral mucous membranes posteriorly is an advantage, and the restoration of this continuity is one of the important principles of the Harris operation; the intra-urethral method of digital enucleation recommended by Harris (*Brit. J. Surg.*, 1934, **21**, 437, 442) is designed to leave intact the verumontanum and the urethral mucosa below it.

The shock produced is due to a summation of all the traumatic stimuli set up in the whole operation, and it is difficult to believe that the shock from hemiprostatectomy is only one-half that of total prostatectomy. In any case the shock can be minimized by a suitable combination of anaesthetics and by gentle rather than rapid enucleation.

Mr. Sampson Handley states that he has no experience of later enlargement of the residual lobe after hemiprostatectomy; I have recently seen and operated upon such a case. Left hemiprostatectomy was performed by one of Mr. Handley's colleagues in June, 1933, for a man of 57 with acute retention (two-stage operation). In May, 1941, he returned with acute retention: there was gross urinary sepsis and his general condition was poor. The remaining right lobe was moderately enlarged on rectal examination, but was seen on urethroscopy to project to the left and to produce much distortion of the urethra; on removal it showed the usual changes of senile enlargement. This patient died six months later from hypertensive failure and auricular fibrillation.

To compare hemiprostatectomy with endoscopic resection seems to confuse the issue; endoscopic resection undoubtedly has an important place in prostatic surgery, and it may be mentioned as a personal experience that where an adequate amount of tissue is removed in the first place by resection from a benign enlargement there is little tendency to a return of obstructive symptoms later.

After this preliminary report I shall await with interest the after-histories of the two patients operated upon this year and of the others for whom the operation has been done, but on the present evidence I am unconvinced that it has anything to offer over the accepted methods of treatment.—I am, etc.,

London, W.1, Nov. 24. E. W. RICHES.

SIR,—I have read with interest Mr. W. Sampson Handley's article on hemiprostatectomy (November 15, p. 681). In it he states that transurethral resection accomplishes "at best a partial removal of the adenomatous mass, the rest of which may continue to grow with a return of obstructive symptoms." Surely this description is more readily applicable to the operation he describes than to the modern "punch" operation, perfected by Gershom Thompson and Emmet. I have had the privilege of seeing Mr. Wardill of Newcastle using the "cold" punch, and can assure Mr. Sampson Handley that the removal of adenomatous gland is very nearly complete: ". . . as much of the enlarged gland is removed as possible. This in many cases must amount to about four-fifths; in some cases as much as 64 grammes has been removed at one sitting" (Wardill, W. E. M., *Lancet*, 1941, **2**, 127).

The statement that "it seems likely that hemiprostatectomy will have a lower mortality and will offer more security against the recurrence of obstruction" (than punch prostatectomy) does not seem to be a fair conclusion to draw from the two cases quoted, and is indeed rather surprising, when the fact that in 1935 Gershom Thompson published a series of 451 punch operations without mortality was noted earlier on the same page.

Furthermore, the convalescence after the punch procedure is very considerably shorter than with open operation—usually about eight to fourteen days. Also the patient is out of bed and walking about one or two days after operation, a most important point when dealing with elderly men. Lastly, in the hands of experts the punch method is applicable to all cases, whereas hemiprostatectomy can at best only be applied on comparatively rare occasions.—I am, etc.,

Lincoln, Nov. 25. G. A. BAGOT WALTERS.

X Rays in Treatment of Inflammations

SIR,—It is difficult to write with moderation in disapproval of the comments at the end of the annotation on "*X* Rays in the Treatment of Inflammations" (November 15, p. 700). The suggestion contained therein that hospital or armament works casualty officers after a few weeks' training would be competent to prescribe and administer *x*-ray treatment is courting disaster. The inadequately trained and insufficiently experienced in *x*-ray therapy would be a grave menace to patients, to themselves, and to any organization that they serve. It would be infinitely preferable to forgo the doubtful advantages of ill prescribed and administered radiation than to risk the calamities that can follow misjudgment.

Drs. Pendergrass and Hodes in their article describe their technique under five headings, and complete their prescriptions under each of the conditions with which they deal. Their technique includes the use of what has become familiar to radiologists as (1) near-distance therapy, (2) medium therapy, with and without filters, and (3) deep *x*-ray therapy: the whole armamentarium of modern *x*-ray treatment, three separate and distinct *x*-ray installations. The technique is not simple and the doses required are not, as the annotation states, so small that there is no risk of radiation injuries. On the contrary, the authors, dealing with bursitis and with the shoulder under consideration, state: "Occasionally six or eight exposures have been necessary. Under such circumstances multiple portals have been utilized to preserve the skin tolerance to irradiation." They have thought it desirable to draw attention to this in the text and in the caption. Again, under erysipelas, although they have had no untoward results, they say: "Patients should be warned of the possibility of epilation and a signed permission obtained before starting roentgen therapy." Special warning is also made in connexion with the use of near-distance therapy and the treatment of verrucae and similar lesions. The authors are not unmindful of the risks.

The interpolation in the annotation of the bald statement of "100 to 200 *r* daily for three to five days," totally unqualified as to filtration, area and how measured, with or without back-scatter, is no "so small" a dose, and it may prove to be misleading. All who have read the annotation in question should read Drs. Pendergrass and Hodes in the original, when they will recognize how dangerous the concluding advice of the annotation may be.—I am, etc.,

London, W.1, Nov. 25. H. COURTNEY GAGE.

Sciatic Pain

SIR,—Your leading article (November 15, p. 698) gives a true picture of the present position. "The major problem remains" indeed. But does "the next step lie in the direction of pathology"? And are not the terms used misleading, rather than only "quite devoid of meaning in terms of morbid anatomy"?

Idiopathic sciatica, lumbago, and related processes come and go in the vast majority of cases. Such pathological changes as may occur in the tissues must correspondingly be assumed to be reversible. Biopsy of the suspected organs is hardly ever possible since surgery is not called for. Where it was done, as in the work by F. and M. Lange (*Die Muskelhärten oder Myogelosen*, Munich, 1931), there was no histological evidence of any change, certainly none of inflammation, as indicated in terms like myo*sitis* or fibro*sitis*. Nor was inflammation found in the few cases of chronic sciatica examined post mortem. Spielmeyer found signs of thickening of the nerve sheath and degeneration of the nerve fibres. It is safe to state that whatever the underlying pathological process may be it is not—in the vast majority of cases—a true inflammatory one, and the terms we use are wrong. Animal experiment is not likely to help us, since pain is the only subjective symptom. And objective evidence of its existence will only be obtained if the animal limps. It is doubtful whether, owing to their coat, animals are likely to suffer at all from the passing forms of "muscular rheumatism" or neuralgia.

With the three usual paths of inquiry—biopsy, post-mortem examination, and animal experiment—blocked, how can we hope to arrive at a clearer picture of what causes the painful state, and what happens morphologically while it lasts? May I suggest that an indirect approach by way of a working hypothesis might prove useful to those who see large numbers of such patients and who have facilities for physiological research. Three sets of facts form the basis of such a working hyopthesis: the exact history of the patient and the closely followed course of the condition as indicated by the curve of his main symptom, pain; the pathological physiology of the vegetative nervous system, so far as it is known through the work of Krogh and Lewis; and the normal anatomy of the vascularization of muscles, tendons, and nerves.

The common history of the attack of both lumbago and sciatic pain is that the skin of the patient at the onset was wet, either because of damp weather or through sweating, or both. Common, too, is a state of physical strain or exhaustion—frequently a state of overwork or worry and an excitable mental make-up. True trauma, unless "asked into" the patient, is rare. Common is a start of pain after bending down, involving mechanical pressure by belts, etc., on the lumbar region. The pain in lumbago starts more or less at its worst and wears off within days or a week or two; the pain in sciatica takes a few days to rise to its peak, remains at a high level for weeks, and wears off very gradually. It starts proximally, extends downwards, and ends eventually by first leaving hip and thigh and later the leg and foot.

That wet skin is a better conductor of heat and cold than dry skin is known. That cooling of deeper tissues under wet skin is possible is recognized. That a state of unbalance of the tension of arterial and capillary walls is set up by changes of temperature, leading to spasms of contraction or dilatation with consequent interruption or slowing down of the flow of blood, we have been taught by Lewis. In order to understand the predilection of painful reactions related to muscle groups, tendons, and nerves, we have to remember that in muscles several factors combine to oppose a smooth passage of blood—the normal or increased muscle tonus, stretching over joints, compression under belts. Tendons, fascia, ligaments, and nerve sheaths have in common a poor supply of blood vessels and no or hardly any provision for the setting up of a collateral circulation. It must be remembered that, for example, only one nutrient artery enters the sheath of the sciatic nerve below the junction of its roots, and this does so at an angle which favours mechanical closure of the lumen quite apart from spasm. (Little is known about the vasa nervorum. On 200 transverse serial sections I convinced myself that there is really no other source of arterial blood along the whole course of the nerve.) Any temporary stoppage of the supply of fresh blood in these tissues therefore must be followed by more drastic consequences than in tissues with more ample vascularization or greater chances for collateral circulation. Short of total ischaemia and consequent atrophy or necrosis, we must assume that intermediate and reversible states of degeneration may be caused which most likely are in the nature of what is known in the heart muscle as "cloudy swelling." Such swelling in turn would lead to compression of veins and lymph channels, increasing the swelling and setting up a vicious circle even if the causative spasm of the artery has already worn off. Not before normal circulation is re-established will this swelling be absorbed. As long as it lasts it is bound to cause pain by distension and pressure on sensory nerve endings, especially in a tissue as dense and tight as a nerve sheath. With or without treatment normal circulation is being re-established—slowly in a long nerve, quicker in a muscle or tendon. And once normal conditions have returned nothing would show that the process had taken place.

The hypothesis of a disturbance of circulation as the basis of myalgias and neuralgias is not new in itself. But I do not remember having seen a clear description of its possible pathological course. It is as difficult to prove to be right as to disprove. And while many clinical facts are in its favour it may

not ultimately prove to be right. As it is, it helps us to understand many otherwise isolated features. The neuralgias of a few hours' duration can be understood as well as the effect of cooling on a motor nerve in Bell's palsy. Neuralgias in conditions known to involve the vessels—as diabetes, diphtheria, lead poisoning—may be viewed from this angle. And some of the difficulties in therapy may be explained. Heat, for example, seems to help while it lasts, but warmth in bed is not liked (increased congestion?). The success of vitamin B treatment may be based on the action of nicotinic acid. Not more can be said than that here is a working hypothesis which might help understanding and further inquiry.—I am, etc.,

London, W.1, Nov. 24. L. MICHAELIS.

Industrial Medical Boards for Women

SIR,—The letter from Dr. E. M. Herbert on industrial medical boards for women raises an important issue, but why should such not be established for industry in general? This is a way in which medicine can make an important contribution to the war effort. To suggest two directions only: first, there should be a system of grading and classifying labour at the labour-engaging centres. So urgent is the demand for labour in the heavy industries that all sorts of derelicts have been mobilized in the former distressed areas and sent, at no small expense, to attempt work for which they quickly prove to be totally incapable. We have had epileptics, chronic asthmatics, cardiac cases, and the like sent to factories where only men physically fit for long hours of heavy manual work are of service. The most casual examination of many of these would have eliminated this waste by frankly writing off the applicant as unemployable, or by diverting him to a job where he might be of use. Secondly, as regards the movement of labour under the Essential Work Order, where a factory has its own medical officer he is often able to rebut statements, frequently grossly exaggerated, by an employee to the effect that work and conditions are "ruining his health." But there are hundreds of factories on important war work, too small to have a doctor on hand, which are at the mercy of any employee able to bring a certificate labelled "Bronchial catarrh: recommended for change of employment," and who regards such as a charter sanctioning immediate release. True, the National Service Officer, if he is so moved, may refer the case to a referee, but such an officer is chosen quite casually from some Government Department and has not necessarily any knowledge of industrial conditions. The comments of industrialists on this lax system and on the ease with which such certificates are obtained are unprintable, though I acknowledge that in this area certificates are now worded much more cautiously.

Medical boards are judged to be essential in a system of military conscription. They have an equally important service to render to the country in a system of industrial mobilization. Their establishment might make the existing tentative element of compulsion in industry less uncourageous and full of loopholes than it is at present.—I am, etc.,

Nov. 24. A. H. DRIVER.

SIR,—Dr. E. M. Herbert's letter (November 15, p. 711) interests me very much and at the same time causes some perturbation. His letter implies that there exists in industry today a state of affairs which is truly appalling, and as chief medical officer of a group of factories employing some 31,000 workers I feel that I cannot let his allegations pass unchallenged. I would suggest that Dr. Herbert's experience of industry proper must indeed be limited, otherwise he would have hesitated before making the sweeping statements he does. The entirely erroneous impression he creates about lack of selection, lack of supervision, must, I feel, be corrected at once. Dr. Herbert has completely ignored the fact that by law all factories engaged on munition work and employing women must provide adequate welfare supervision, and, depending on the numbers employed, appoint nurses and part- or even whole-time medical officers. Dr. Herbert further states that there is no medical examination of females. This is quite untrue. I would suggest that he should have got in touch with the medical and welfare staff of any large concern in this or any other district before making a blunder of this magnitude. I can say definitely that, had he done so, he would have found that the examination and supervision he maintains are being neglected are being most conscientiously carried out. The *British Medical Journal* is widely read in the U.S.A., and I feel that it is my duty to offset the entirely misleading impression Dr. Herbert's letter must create in that most friendly country.

The question of medical boards throughout the country is quite another matter; but why only for women? I should like to see such boards set up by the Ministry of Labour, not to supervise but to advise employers. Considerable difficulty is being met with to-day by reason of workers of both sexes claiming that their health is being injured by this job or that job, night shift or overtime. Frequently the works medical officer is asked to give his advice in such cases, and often finds himself in disagreement with the private doctor's opinion. This practice, I submit, is most undesirable, and such questions should be dealt with by a medical board of experts.—I am, etc.,

Nov. 24. NEIL G. MARR, M.B., Ch.B.

SIR,—It would be interesting to know on what data Dr. E. M. Herbert (*British Medical Journal*, November 15, p. 711) bases his sweeping assertion that women entering munitions receive no medical supervision in the factories. The Ministry of Supply has established in all Royal Ordnance Factories medical departments which are being developed and expanded as the factories grow in strength, and in these establishments, where the weekly labour intake is very large, every new employee, from manager down to the humblest process worker, has to pass a medical examination before being taken on. Applicants are examined with a view to the particular work to be done and are graded accordingly, different standards of physical fitness obtaining in the different factories. For instance, a girl who is fit to make shell and bomb cases may be quite unfit to handle the high explosive with which they are filled, and vice versa. These examinations are carried out either by the factory medical officer or else by outside practitioners, the former, in my opinion, being more satisfactory, as the works doctor is in a much better position to assess the hazards of the various processes.

Once in the factory the worker comes under the supervision of the medical officer—in the larger establishments there are several full-time medical officers—and has the right of appeal in all cases where she feels she cannot for health reasons carry out the job to which she has been assigned. The medical staff also supervise and treat so far as possible all cases of industrial disease and accident, and also periodically inspect those workers who are exposed to special health risks.

I cannot speak for the other Ministries, nor of private enterprise working on Government contract, but I believe I am right in saying that works medical officers are being employed in ever-increasing numbers, and that before long the factory doctor will be an integral part of the factory management.—I am, etc.,

CATHERINE N. SWANSTON,
Nov. 24. Factory Medical Officer.

Economy of Medical Man-power

SIR,—In view of the urgent need for medical officers in the various Services, it is of the utmost importance that (1) overlapping by the various Services should be eliminated, and (2) that medical officers in any Service should be used as economically as possible.

In regard to (1) there is no need to multiply instances, but I will quote one only—250 aircraftmen were sent to one of the healthiest spots in England: presumably they were all fit men, yet, although there was a naval hospital in the place with naval surgeons, and at least two military units with regimental officers, a medical officer R.A.F.V.R. had to be posted there. There is, I believe, a Commission looking into this matter now, but a medical officer recently told me that he understood the Commission was in his neighbourhood, but that although he had some excellent constructive suggestions to make he did not know how medical officers were selected (his phrase) to give evidence.

In regard to (2) there is at present in the Army a great number of doctors employed on non-medical jobs. I don't think that matters are as bad as in the last war, when I held the

post as officer in charge of Divisional Laundry on the outskirts of Bethune.

(*a*) *Clerical Work.*—A great deal of this could be done by physically low-grade non-medical officers, or, even better, by A.T.S. officers. It may sound revolutionary, but I can see no reasons why the D.A.D.M.S. of a Division should not be an A.T.S. officer. Voluntary hospitals of the size of Bart's and the London are, and have been for long years, administered perfectly satisfactorily by lay staffs. And many men in big positions find a lady secretary very satisfactory. I feel that our own profession owes much to the loyalty, devotion, and efficiency of the private secretaries. Where indeed would Harley Street be without the secretaries? If it is thought to be too much to appoint a lady to act as secretary to the A.D.M.S. of a Divisional H.Q. likely to go over-seas, instead of having a D.A.D.M.S., the same argument could not apply to A.A. Divisions or Area Headquarters and junior home staff appointments.

(*b*) *Sanitation.*—The inspection of markets, lodging houses, and alleged sanitary defects in our great cities is carried out by non-medical sanitary inspectors. The R.A.F. place a bomber in charge of a sergeant though officers may form part of the crew. Why, then, could not "hygiene sergeants" R.A.M.C. be appointed to inspect camps, etc.? I suggest that such a sergeant on finding any defect should make a report in duplicate, either using an indelible pencil and carbon copy or typescript if he can type and machines are available, one copy to be sent to the O.C. unit concerned and one copy to the M.O. i/c sanitation of the area (corresponding to civil M.O.H.). A fortnight later he should visit the camp again. If all is well now, a second report should be made as before. The reports in the M.O.'s office would cancel out and no action would be required, but if the sergeant found that no action had been taken at the camp he should issue a second report, preferably on a different-coloured paper—say, pink (for rapid recognition). The M.O. i/c sanitation would visit the O.C. of any area on which he had received a "pink report" to find out (i) why the sanitation was defective, (ii) why it had not been remedied after the first report, and (iii) if he considered it necessary to report the matter to higher authority to inform the O.C. of his intention. Most O.C.s are as keen as anyone to have good sanitation, and, as a rule, on his attention being drawn to any overlooked fault, he will take immediate steps to remedy it. By these methods M.O.s would be freed to do purely medical work.

This letter is already overlong, and so I will not elaborate that side of it, but increased facilities for carrying out minor medical and surgical procedures and a better clinical supervision would shorten the time spent by the soldier in receiving treatment. A colonel in the last war asked me: "How is it that in civil life an employee can have a tooth out and be back at work in under an hour, but if I send a soldier to get a tooth out I don't see him again for six weeks?"—I am, etc.,

Hove, Nov. 27. H. J. MCCURRICH.

The Nation's Dental Services

SIR,—Your article on the nation's dental services (October 4, p. 488) interested me greatly. The memorandum, to my mind, is perhaps one of the most important and far-reaching of any on the subject of dentistry. The great danger is, however, that views expressed will be allowed to lapse into obscurity in the maelstrom of war and that nothing further will be done.

It is a healthy sign that the students themselves have realized that the foundation on which our study of dental disease is based is unsound and unscientific, which is certainly the case. The link between so-called dental disease and systemic conditions is very real and intimate, and if only it were realized that in the teeth we have the most sensitive "indicators" of upsets in metabolism the whole science of dentistry would be revolutionized. There would be no more talk of the status of the dental surgeon; he would become a key man in our study of disease in general.

All this, however, can only come about if the whole foundation of dental training is altered and more time is spent on the biochemical side of dental disease. We should ask ourselves more often why dental caries or pyorrhoea is present rather than treat the condition by fillings or extractions. To-day, in dentistry, we are only treating the symptoms of metabolic upsets and not treating the causative factor of the symptoms. We have for too long taken the *ipse dixit* of our pastors and masters for granted, and followed blindly in their misleading and bewildering footsteps, with the net result that dentistry to-day is not a science but a highly specialized symptomatic treatment.

If only the memorandum is followed up and acted upon by the younger members of the profession it may well be that it will lay the foundation of a more scientific outlook on the training of dental surgeons. More important still, it will bring together the medical and dental professions in a closer bond than ever before, to the great benefit of patients.—I am, etc.,

London, Nov. 21. G. E. KING-TURNER, Capt. R.A.M.C.

A Human Ostrich

SIR,—The following case is so out of the ordinary that I think its publication may be justified on that ground alone.

A man aged 25 years was in prison, where he stated he had swallowed various articles. He was removed to a London hospital for *x*-ray examination, but at the hospital he managed to effect an escape, and was recaptured; in view of this behaviour it was thought necessary for him to be operated upon within prison walls. He was transferred to hospital on May 17, 1940. An *x*-ray examination made the same day showed (1) two long metal bodies and a big belt-buckle in the area of the stomach, (2) a screw in the right iliac fossa, (3) a long needle near the ileo-caecal junction.

That evening I operated upon him under general anaesthesia, opening the abdomen by a right paramedian incision. From the stomach I removed (1) a metal punch, (2) a spoon handle, (3) a tin prison-knife, (4) a buckle, (5) a piece of a metal comb, (6) a picture hook, (7) a piece of glass (this I had to work back from the duodenum through the pylorus). I found a needle lying partially through coils of small intestines and in the peritoneal cavity directly over the right iliac vessels. It appeared to have worked through the intestinal walls very easily. Later on he passed normally the screw which had been seen in the right iliac fossa. The third day after the operation, when he was left for a few minutes, he was found standing on his bed looking out of the window at the view. He made an uneventful physical recovery, but his mentality degenerated, and on June 8 he had to be certified insane, and was transferred to a civil mental hospital, from which he escaped.

On September 15, 1941, he was again in custody and admitted to prison with the history of having pushed a needle into his chest. There was a small scratch at the site of entrance internal to the left nipple. *X*-ray examination showed the needle lying to the left of the sternum in a slightly vertical line point downwards, and the lateral view showed it to be inside the thoracic cavity. I opened the chest with a horizontal incision over the sixth rib, and resected one and a half inches of this rib to open the pericardial cavity. Unfortunately the needle could not be found free in the cavity. The heart was beating strongly, and it appeared that the needle lay in the muscle wall; I did not feel justified in attempting its removal, especially as the anaesthetist was by then worried somewhat by the man's condition.

On September 24 he passed four large pieces of glass per rectum, which did not injure him in any way. These he admitted swallowing about ten days previously in prison. He developed an empyema on October 13; I resected a part of rib and drained this: fortunately he made an uneventful recovery, the wounds being practically healed on October 30.

The special points to be noticed are (1) that he could swallow large foreign bodies and (2) that he could pass glass fragments without any damage to himself.—I am, etc.,

Nov. 18. J. W. MCK. NICHOLL, M.D., B.Ch.

Sarcoma treated with Coley's Fluid

SIR,—While I was acting as locum for Dr. G. W. Ayres, the Priory, Chippenham, a male patient aged 33 consulted me. Both Mr. C. Kindersley and Mr. Fuller, jun., of Bath saw him with me: the growth observed was *x*-rayed, and a biopsy was done. The growth was huge and covered the left scapula, and was diagnosed as a sarcoma. Mr. Fuller removed

it in May, 1941. It was found to be encapsuled, and a portion of the trapezius over the tip of the scapula was involved and was removed. Microscopically it was proved to be a sarcoma. As it was impossible to bring the edges of the wound together, a few weeks later skin grafting was done. The growth quickly returned over the scapula and broke down. Radium treatment was not advised, and on August 12 he was sent home to die.

I determined to try Coley's fluid red, as the patient and I both felt it was far better for him to die fighting than quietly to face the inevitable. He was in fine spirits at the thought of this desperate fight. The Coley's fluid red was given in sterile distilled water. The injections were commenced on August 28, and were given into the pectoralis major muscles.

	c.cm.	
Aug.	28—0·1	Slight reaction
,,	29—0·15	,, ,,
,,	30—0·2	Severe ,,
,,	31—0·25	,, ,,
Sept.	2—0·3	Much the same reaction
,,	3—0·35	,,
,,	4—0·35	,,
,,	6—0·4	,,
,,	7—0·45	Reaction came much sooner
,,	9—0·5	Reaction severe
Sept.	12—0·55	Reaction very severe. Temperature was 104° for eleven hours
,,	16—0·55	Reaction not so severe
,,	23—1·0	,, ,, ,, but continued much longer
,,	30—1·0	Reaction rather more severe, and more prolonged
Oct.	7—1·0	Reaction much the same
,,	18—0·5	Very mild reactions
,,	25—0·5	
Nov.	1—0·5	
,,	8—0·5	

The patient returned to work on October 25. On September 30 the growth had entirely disappeared, and the skin was perfectly healed, though red and shiny. When I left Chippenham on November 9 he was working well, and there was absolutely no trace of any return. The skin was smooth, the redness becoming less, and he was in excellent health. Mr. C. Kindersley, Mr. Fuller, and Mr. Levis of Bath all agreed that the growth had disappeared.

I am aware that this treatment has often been tried in the past, apparently with poor results. In my opinion far too small doses were given. In this case large doses were given, and I ascribe the excellent results to this fact. The patient's confidence in this treatment and his plucky fight were contributing factors.—I am, etc.,

Hereford, Nov. 17. J. VINCENT SHAW.

Hospital Policy

SIR,—The recent correspondence in your columns on hospitals, voluntary and otherwise, should help a great deal to the definition of hospital policy sought by Sir Frederick Menzies (November 8, p. 666). The state of affairs which leads to local authorities providing parallel facilities with voluntary organizations is too wasteful, yet the spectre of a waiting list three months long is intolerable.

Close co-ordination, or, better, coalescence, is essential. Coalescence under a regional committee, foreshadowed by the Minister of Health, with a composition suggested by Sir Frederick, can and must lead to all-round improvement provided that voluntary hospital boards will submit to a slight loss of despotism. They have served us nobly and should not pass away outwardly, but by merging all interests for the common weal all would benefit. A regional scheme need not eliminate the tradition or individuality of any unit; the power of a regional committee can enhance the work of all. Central bodies should not be scrapped, but let us have the minimum of red tape.

The nucleus of each regional scheme should not be a committee but a medical school, with the various hospitals and departments which constitute such a body. There need be but little change in its work, but it can easily exert a powerfully beneficent influence on all hospitals in the region. Its facilities and brains will be at the disposal of every patient in the region, and the best teaching and research material in the region will gravitate towards it. In a similar manner the best clinicians will gravitate to the nucleus, to the advantage of every patient, every student, and the advancement of medical science. Satellite hospitals—general, special, and chronic—fall into place under regional planning. Highly specialized teams can be accommodated in the most suitable hospitals; even teaching can be carried out in small hospitals on something like an apprenticeship basis before qualification. In essence every hospital can be elevated to teaching hospital standards.

One necessity emerges: the medical staffs must be remunerated for their services on such a scale that private practice is a secondary consideration, but the latter should be permissible and the private ward system should be extended. Finance in such a scheme depends on post-war conditions, but whether we make everyone pay directly or through contributory schemes, or make the whole scheme a State charge, nothing need prevent the grateful patient showing his appreciation or the public benefactor his magnanimity.—I am, etc.,

Cambridge, Nov. 21. ROBERT CAMERON, M.B., D.P.H.

SIR,—Your leader (p. 657) and the letter of Sir Frederick Menzies (p. 666) dealing with new developments in hospital policy (November 8) draw attention to the need for the expression of constructive views on this important question. There has been a considerable amount of correspondence in the *Journal* on the merits and demerits of municipal and voluntary hospitals, but no useful purpose can be served by the continuance of destructive criticism of one system or the other. We now need constructive proposals to secure a combined and eventually a unified system of hospital provision, which will give adequate and suitable accommodation, without avoidable delay, for every type of disease requiring hospital treatment.

Sir Frederick Menzies recommends the formation of regional councils, which would act as governing hospital bodies for the areas to be formed by the grouping of several local authorities. He also submits that in the constitution of regional councils there should be equal representation of municipal and voluntary hospitals, and that the Minister of Health should have power to nominate independent representatives of the Ministry. This latter proposal is one of real practical value which will commend itself to all who desire to encourage the smooth development of hospital policy. It will not only secure, as Sir Frederick points out, a holding of the balance of reasoned opinion when conflicting interests arise, but it will also facilitate the more rapid completion of schemes, and expedite the fulfilment of important matters of policy which have to be approved by the Ministry.

In the constitution of these regional councils it is assumed that, apart from hospital representatives who are medical men, there will be some independent representation of the medical profession, not with a view to holding a watching brief for medical interests, but to provide for the expression of informed opinion regarding the needs for hospital treatment from the viewpoint of general practice. The regional councils outlined by Sir Frederick Menzies would deal with broad questions of policy and principle, including the important question of Government grants and financial aid, leaving administrative details presumably to local committees. In due course the best means will have to be considered for maintaining "liaison" between the regional councils, if and when established, and local committees and hospitals.

The unification of the hospital system in this country is, in the opinion of many, urgently called for, but before it can be attained not a few thorny problems will have to be solved. This is emphasized in your leader, which refers to the views expressed by Sir Francis Fremantle and Prof. A. V. Hill in their speeches in the House of Commons as to the need for gradual progress in the development of hospital unification. A desirable preliminary step in this direction would be to promote round-table conversations between the representatives of municipal and voluntary hospitals in each hospital area.—I am, etc.,

Helensburgh, Nov. 21. H. HYSLOP THOMSON.

The Hospital Problem

SIR,—I hope that you will extend the hospitality of your columns to one who is outside the medical profession but, none the less, vitally interested in many of its problems.

I have been greatly interested in the discussion of the cases for the municipal and voluntary hospitals, and especially by the contribution of my old friend Dr. James Cook of Glasgow (*Journal*, November 8, p. 667). I think that one or two points in his letter require qualification and modification. In the first place, the slaves of Claudius's time were compelled to enter the hospitals so that they might be rendered fit once more for

their tasks. They had no choice in the matter. While it is true that much of the modern hospital's work is to restore men and women for their industrial and domestic occupations, it is only a fraction of their missions. Again, we have to remember that the slave of the Roman Empire had little in common with his namesake of *Uncle Tom's Cabin*. In many cases the Roman slave-owner was on terms of intimacy and friendship with his slaves; as boys they were probably brought up and educated together. From the slave class, too, were recruited many members of the "learned" professions—notably the teachers and physicians, both of whom Juvenal associates with tight-rope artists, fortune-tellers, and attendants at the public baths! We have, then, to keep in mind this personal relationship of master and slave when we are tempted to deny a spirit of altruism to the founders of Claudian infirmaries.

Dr. Cook castigates the system whereby the shepherd "wrapped in the fleeces of his flock" goes to the private home while his shorn sheep are relegated to the municipal hospital. An analysis of that will probably give us good clues towards proposals for a revision of the hospital system. Why does he go to be "fleeced" at a private nursing home? Because (*a*) the medical profession expects a man of his position to do so; (*b*) the municipal authorities no less look to him to do this; (*c*) the voluntary hospital authorities will darkly hint—or pointedly suggest—that their beds are not for him; (*d*) the hospital for which a "works" card is necessary will not receive him without the very form for which he has no qualification, as he is not a contributor to the "scheme." In other words, our ideal system will have to take account of all four of these factors.

Now the obvious defect of the voluntary hospital is that it makes essential work depend upon uncertain charity. The manifest defect of the municipal hospital is that it allows the typical "high-handedness" of officialdom to invade what is basically a personal service. The glaring inefficiency of a hospital supported by workers' contributions is that it leaves out of account the man who cannot subscribe and "the stranger that is within our gates." But both the voluntary and the works subscription hospital lead to a sense of ownership in the community which is at once valuable, and absent in the instance of the municipal hospital. Why this is lacking in that case I cannot tell: I mention it as the conclusion to some years of experience.

There seems little doubt from my own observations (I was a member of the staff of one of our large voluntary infirmaries). that the future of the hospital lies either with the municipal or subscription (covenanted) supported type. 'Now Dr. Cook has surprised me by suggesting that the tending of the sick should be placed on a level with sewage disposal. Surely he will allow that a man's illness is in a much deeper sense a personal thing than his ashes, old newspapers, and empty sardine tins. Sickness belongs to a man as refuse does not. That fact must be taken into account in any plans for the future of hospital treatment.

I have been surprised that the control of hospitals entirely by the medical profession does not feature prominently as a suggestion in the discussions on this problem. Briefly, I believe that the facilities for hospital treatment and care ought to be the property of the accredited medical practitioners of the particular community. The points to be kept in mind are: (1) The medical profession will be absolute in its rightful sphere. This will avoid the ridiculousness of the average committee of a typical voluntary and covenanted-subscription hospital and the "prison governor" methods of the majority of the superintendents in municipal hospitals. Let the medical profession learn the lesson from the teaching world. Let us have no counterpart of the "touting" for appointments of "the butcher, the baker, and the candlestick maker." (2) There will be a sense of ownership by the community. I have already mentioned this as one of the desirable features of the non-municipal hospital. The community will feel its responsibility towards its clinic and hospital. (3) There will be no closing of doors against personal service and benefactions to the hospital; there will be scope for these under the jurisdiction of "the profession."

We have to rid people of the idea that, even if we allow that the care of the sick is a very personal service, the adequate provision of hospital and medical facilities can rest on a haphazard voluntary basis. The teaching profession is, nowadays, well esteemed; we do not despise the schoolmaster because he draws an adequate salary from a well-provisioned municipal undertaking. But time was when the training of the young was regarded as a personal service, and, therefore, to take money for doing so was mean and despicable. Time was when the professional schoolmaster was ranked in society with the man who hawked kippers in the street. Whatever "scheme" is finally selected will have to make its way against prejudice and misunderstanding. But the more it preserves of the best features of the old voluntary hospital system, so much the more will it commend itself to "us, the people." I venture to suggest that my scheme for absolute ownership by "the profession" embraces those aspects. I should be glad to have the observations of "the new owners"!—I am, etc.,

St. James's Vicarage,
Darlington. Nov. 14.

KENNETH HARPER.

SIR,—The voluntary hospitals claim to treat the sick better than do the municipal hospitals by reason of possessing superior tradition, atmosphere, standards, and exponents. The following would appear to be among the chief virtues of the voluntary hospital system:

1. It is a personal and flexible form of local self-government, reminiscent of democracy, specially adapted to each separate hospital and therefore well calculated to influence the conduct of those in direct contact with the sick, as well as producing a readier consent of the governed.
2. It works to broad principles rather than written rules.
3. It shows a full appreciation of the value of local *esprit de corps* and supports it as a policy
4. It acknowledges that continuity of standard is essential and pursues this as a policy.
5. It has no place for the party politician, his whims, his wiles, and his nostrums, and provides no privileged opportunity for his public advertisement at the expense of staff and patients.
6. Under its sway professional standards applicable to the sick are more generally acknowledged and uniformly supported throughout the whole organization, both professional and lay, and alien creeds are not encouraged.
7. In making appointments to the staff the need of the hospital concerned is the only consideration and is paramount.
8. In it the factors productive of stress and strain to the staff are almost exclusively professional.
9. In it every specialism is considered a full-time job in itself; progress through the various stages of that specialism is better safeguarded, can be more accurately assessed, and its practice more effectively controlled and is moreover less likely to be involved in extraneous responsibilities.
10. Under the voluntary hospital system character is more uniformly an asset than a liability, and, in general, personal advantage is less likely to be at variance with professional duty.
11. In it local security of tenure is the rule and compulsory transfer of staff from hospital to hospital unknown.
12. The work of the ward sister is recognized as a life work in itself, and the possibilities of her contribution to hospital atmosphere, standard, and tradition are highly rated and fully acknowledged.
13. It provides opportunity, leisure, and rewards for its senior professional staff commensurate with their ability and position and in such manner as to stimulate progress.
14. It admits there are limits to the effective range of human control over others, and its practice is not suggestive of the dinosaur.

Virtues not all perhaps conspicuous by their absence in municipal systems, but conspicuously inconspicuous in some. The voluntary hospital arrangement is a pleasant, attractive, and effective system, with the path of honour eased and rendered even more attractive by a judicious use of limelight and the constant attentions of the mighty. Wise, too, for a job made easy is already half done. But freedom may become pathological and the enervating character of mutual admiration tend to smugness, especially when sequestered and aloof, protected from the buffetings endured by lesser breeds.

Time was in the tradition-forming days when the sole test for admission to the voluntary hospitals was the need of the

patient, and none was too dull, uninteresting, or unpleasant. Time was when character, religion, altruism, and untiring vocational nursing matched the present claims. For many years past, however, honour has gone where difficulties, other than technical, have been least—that is, to voluntary hospital staffs; public neglect and disdain have gone where the difficulties were greatest—that is, to the municipal hospitals. The levelling-up process (so called) proceeds apace in the municipal hospitals, however, though often with noticeable lag in municipal hospital enthusiasm, which quality was never greater, in my opinion, than in the years before 1929, when, though local difficulties were rife, they could be got to grips with and a generous meed of the above fourteen points was obtainable, and individualism, I fear, had scope. But that, of course, was making it much too easy. Incidentally, one notes that the medical superintendent casts his baneful shadow. Might one inquire if the comparable counterparts in the voluntary system are equally baneful, and, if so, are the hospitals so afflicted the least seaworthy? My name is unimportant, my pseudonym not.—I am, etc.,

Nov. 13. "BEWARE THE POLITICIAN."

Surgical Instruments for Russia

SIR,—Surgical instruments of all kinds are urgently needed by the U.S.S.R., and at present it is possible for the manufacturers to supply only a limited number. Among the instruments required at once are:

Artery forceps of every description.	Bullet or swab forceps.
Record syringes and needles (international standard pattern).	Aneurysm needles.
Needles of all kinds (including intravenous, blood-transfusion, hypodermic, and spinal).	Surgical needle holders.
Scissors of every description.	Bone forceps.
Towel clips.	Scalpels and amputation knives.
Dissecting forceps.	Plaster cutters.
Aural forceps.	Tracheotomy tubes.
	Abdominal retractors.
	Volkmann retractors.
	Sterilizers and autoclaves.
	Dental instruments.

The Anglo-Soviet Medical Committee appeals to all who have any surgical instruments which they can spare to send them as soon as possible to the Secretary, Joint Committee for Soviet Aid, 171, St. Stephen's House, Cannon Row, Bridge Street, London, S.W.1. The need is urgent, and instruments received will be dispatched promptly. Instruments which require to be re-plated or repaired will be accepted with gratitude, and will be restored to good condition before being forwarded to the U.S.S.R.—I am, etc.,

Nov. 24. A. E. WEBB-JOHNSON, President, Anglo-Soviet Medical Committee.

R.M.B.F. Christmas Gifts

SIR,—Referring to my appeal on behalf of the Christmas Gifts Fund of the Royal Medical Benevolent Fund, I recently received a letter from a doctor aged 78. He and his wife, aged 72, are both beneficiaries of the Fund and their joint income is £169. They have been recipients of our Christmas gifts, and their letter states:

"As Christmas approaches we think of the special gift which the Committee has so kindly sent us for several years, but would like to make a suggestion. Since we came to this little farm worker's cottage we find expenses are easier than formerly. It would therefore give us much pleasure if our Christmas gift this year was given instead to someone who has been bombed out of home."

Many of our beneficiaries have unfortunately suffered through enemy action. May I, through your columns, ask those of your readers who have not yet responded to my Christmas appeal to send in their contributions as soon as possible to the Christmas Gifts Fund, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, S.W.15.—I am, etc.,

Dec. 1. THOS. BARLOW, President.

A pamphlet giving particulars of films dealing with physical recreation and health education has been published by the Central Council of Recreative Physical Training, 58, Victoria Street, London, S.W.1. The title of the pamphlet is "Films about Movement and Health," and it is priced 9d. post free. It should prove a useful guide to those arranging film shows in clubs, colleges, youth centres, etc.

Obituary

THOMAS CHARLES HUNTER, M.D.

The death occurred on November 15 of Dr. T. C. Hunter after a very short illness. He had spent nearly the whole of his professional life in Newcastle-upon-Tyne.

Thomas Charles Hunter was born at Sunderland on March 24, 1876, and was the second son of the late Sir George Hunter, the Tyneside shipbuilder. On leaving Fettes College he intended to become a shipbuilder and went abroad to complete his education. It was while he was in Spain that at the age of 19 he contracted pulmonary tuberculosis. He lived at Davos for the next two years and three more winters. His interest in medicine was now aroused, and at the age of 24 he had sufficiently recovered to begin the medical curriculum at Newcastle-upon-Tyne, where he qualified M.B., B.S. in 1904, taking the M.D. Durham in 1911.

He spent about a year in postgraduate study in Vienna, and for some time was an assistant in a practice at Consett. Then he settled in Newcastle in general practice. At one period he was assistant surgeon at the Children's Hospital, but his real interests were in medicine and diseases of the chest, and he soon confined himself to consulting practice. In the war of 1914-18 he joined the R.A.M.C., but after some months ill-health compelled him to resign his commission, and the rest of the war was spent in the country recovering. He was physician and later consulting physician to the Royal Victoria Infirmary, and also physician to the Chest Hospital in Newcastle. His great interest was the sanatorium for tuberculous children at Stannington, where he was visiting physician for about thirty years right up to the time of his death. Under his guiding influence this institution developed and flourished, and he wrote several papers on various aspects of the clinical work there. He had been a member of the British Medical Association for thirty-seven years.

Charles Hunter was intensely interested in his profession. He was a conscientious physician, deeply sympathetic towards his patients; indeed, his sensitive nature was perhaps rather too deeply moved by suffering and tragedy. He never sought the limelight, and was happiest with his family at his lovely cottage on the Durham moors, where he took a particular interest in growing roses. In his day he was a fine skater, a good lawn-tennis player, and a keen golfer. He never had robust health and had to live within his physical limits; but he faced life with great courage, gave of his very best to the community, and succeeded. His ready smile and warm-hearted friendship will be sadly missed by those who knew him.

G. M. GREIG.

H. O. WEST, M.D., F.R.C.P.

Dr. Henry Owen West, medical superintendent of Queen Mary's Hospital for Children, Carshalton, died on November 20 after a brief illness. He was a student of King's College and University College, London, and after graduating M.B., B.S.Lond. in 1909 served as house-surgeon at King's College Hospital and senior house-physician at the Seamen's Hospital, Greenwich. He proceeded to the M.D. in 1912, took the M.R.C.P. in 1914 and the D.P.H. two years later, and was elected a Fellow of the Royal College of Physicians in 1936. During the last war he held a temporary commission in the R.A.M.C., served as specialist sanitary officer, and was mentioned in dispatches.

A. T. sends the following appreciation:

By the untimely death of Dr. Henry West the London County Council has lost one of its most distinguished and popular medical superintendents. He was chosen by the Metropolitan Asylums Board to be superintendent of Princess Mary's Hospital for Children in 1919, having held several house appointments at King's, the Seamen's, and the Royal Chest Hospitals, and spent five years as tuberculosis officer in Kent.

Hackney, and Stoke Newington. When the L.C.C. took over the M.A.B. and Guardians' hospitals West was accorded the rapid promotion which his experience, ability, and qualifications warranted, and, after being in charge of the Archway and St. Giles general hospitals, was in 1937 chosen to succeed Dr. Gordon Pugh as medical superintendent of Queen Mary's Hospital for Children, Carshalton. This is one of the largest and best-known children's hospitals in the country, and Henry West, with his flair for quiet, happy efficiency, not only maintained but improved its standing. He was a man of great clinical and administrative ability: his outlook and method completely refuted the theory that the superintendent of a municipal hospital is a soulless bureaucrat with limited clinical knowledge and interest. West never ceased to be an ardent clinician, and one of the secrets of his success was that he could, and did, take a close personal interest in his juniors and in their clinical problems. His team at Queen Mary's was a happy one, and when, after the outbreak of war, E.M.S. personnel joined they were quickly incorporated as members. He was by nature a reserved man and no seeker after cheap popularity. He set a very high standard and was persistence itself in his demands for quality of staff and equipment and anything else that would improve his hospital. Of all his many fine qualities his innate genuineness stands out as possibly the most striking. His very arduous experiences of last winter may have predisposed him to the cerebral haemorrhage to which he succumbed. He never spared himself, and was proud that none of his patients suffered serious injury. The profession has lost a distinguished physician and the London County Council an outstanding officer. To his widow and his three sons our sympathy goes out in very full measure.

J. R. GILMOUR, M.B., C.M., F.R.C.P.Ed.

The sudden death of Dr. John Rutherford Gilmour on October 28 brought sorrow and a keen sense of personal loss to his many friends and former patients. Less than three years have passed since he left the post he had held for thirty-seven years in the West Riding of Yorkshire and retired to Overstrand, Norfolk, where he died.

Born in Edinburgh in 1871, and educated at George Watson's College, John Gilmour was a notable student at Edinburgh University, where he graduated M.B., C.M. with first-class honours in 1894. After holding a resident post in the Edinburgh Royal Infirmary and spending a short time in general practice, he joined Sir Thomas Clouston's staff at Morningside as an assistant physician, and so began his career in psychiatry. Becoming senior assistant physician under Dr. Rutherford at the Crichton Royal Institution, Dumfries, he remained there until 1901, when he was appointed by the West Riding County Council to direct the new mental hospital for private patients at Scalebor Park, Burley-in-Wharfedale. He was medical superintendent of that hospital from its opening in 1902 until his retirement in 1939. He was elected a Fellow of the Royal College of Physicians in Edinburgh in 1902, and soon after taking up his post in the West Riding he married Miss Dorothy Rutherford, daughter of his former chief.

Although by nature reticent and unassuming, Dr. Gilmour's personality and ability soon made him a well-known figure in the West Riding, where, in addition to his other work, he had a large consulting practice. Of tall and distinguished appearance, he was gentle and kindly, calm, slow to anger, but quick to detect sham and hypocrisy, and always ready to maintain—against whatever odds—a cause he considered to be right and just. Scalebor Park was his main interest, and the clinical side of his work there attracted him most. He had a shrewd insight into the nature of the problems of the mentally ill, and quickly gained the confidence and co-operation of his patients. Nothing was too much trouble for him and nothing too good for them. His memory was remarkable, and he could draw at will upon his large experience to point a moral or illustrate a case. He took an active part in the medical life of the West Riding, and regularly attended, and was an accomplished speaker at the clinical meetings of the British Medical Association and the Bradford Medico-Chirurgical Society. His fellow psychiatrists recognized his personal attributes no less than his standing in the specialty, when, in 1937, they elected him President of the Royal Medico-Psychological Association. He had been a member of the B.M.A. for forty-six years, and when the Association met at Bradford in 1924 he held office as secretary of the Section of Neurology and Psychological Medicine.

One of his oldest friends (T. B. H.), in the course of a tribute printed elsewhere, has written: "John Gilmour had a commanding presence. He invariably showed exceeding kindness to his patients and their relatives. His staff were well trained and devoted to him. He had a grand sense of humour. He had a happy home and was a delightful host. He was a charming companion on a holiday. He was a faithful friend, and those of us who knew him well missed the tall figure in the Inverness cape when he left the district. He never said an unkind word. He has left a fragrant memory of kindness, efficiency, and work well done."

One of the good old type of family doctors and general practitioners passed away at Bournemouth on October 23 in the person of JOHN ALFRED WARD, aged 77. Coming of Shropshire yeoman stock, he qualified from Guy's and then held some appointments at London public institutions. After that he went into practice at Grays, Essex, where he lived a very busy life for over twenty-five years. Those were the days when doctors had to tackle things somehow or other, before everything was rushed at once off to hospital, and when childbirth was looked upon as a physiological and not a pathological process. Neither did the general practitioner then get those pleasant breaks in the drudgery such as half-days for golf and regular evenings off. Ward was plunged into a most strenuous life with a large practice and constant midwifery in a poor neighbourhood. He was also one of the honorary surgeons at Tilbury Hospital, medical officer of health for Grays Urban District, and medical officer to the training ship *Shaftesbury* in the River Thames. Despite all this he had the grit to take the degree of M.D.Durham for practitioners of fifteen years' standing. This necessitated doing a book of Caesar, and the writer has a vivid remembrance of an early morning visit to Ward's house and finding him half dressed, after a maternity night-out, trying to do morning surgery, eat some belated breakfast standing up, and construe some Caesar, all three efforts being intermingled! We finished the Caesar together, but that little vignette gives an idea of the full life he lived. At this pace, no wonder if he was tired. Fortunately he was able to give up general practice fairly early. He then spent some years as ship surgeon with the P. & O. line, and was able to visit Australia and the Far East. Being unmarried, he had no family responsibilities. He finally retired to live quietly at Bournemouth. A pleasant aspect of his personality was the country farmer element, which he retained through life, with interest in the land, crops, shooting, etc., though he never got much time off to indulge in the last. These few memorial lines are offered by one who was in keen competition with him during that quarter of a century of practice, as a respectful testimony to a genial and quiet personality. *Molliter ossa cubent.*—A. F. B.

We regret to announce that Dr. ALFRED LINNELL died on November 18 at his home in Northampton at the age of 60. The son of J. E. Linnell of Paulerspury Hill, he studied medicine at Guy's Hospital, where he played in the Rugby Cup-tie XV, and qualified as M.R.C.S. in 1883. He returned to his birthplace to work in general practice there, and took a prominent part in the public life of the district. When the Northamptonshire Insurance Committee was set up in 1913 he represented his parish on that body and served for two years as its chairman. In 1920 he was appointed regional medical officer under the Ministry of Health and went to live first at Northampton, then at Leicester, and on his retirement returned to Northampton. Dr. Linnell joined the British Medical Association fifty years ago. He had been president of the South Midlands Branch in 1910, and was a member of the Rural Practitioners Subcommittee 1911-20. He served on the Consultative Council for Medical and Allied Services which was set up by Lord Addison as first Minister of Health, with Lord Dawson as its chairman, but resigned on appointment to the staff of the Ministry.

A correspondent writes: Those who knew Alfred Linnell will treasure his memory as one who was a splendid type of rural practitioner. Great in stature, robust in body and mind till an advanced age, he was a man who inspired confidence. He excelled in open-air sport as a young man. He loved the country and understood it. Kindly, shrewd, and reliant, it is little wonder that he built up a good practice at Paulerspury, the village where he was brought up. He took an active part in parish and Church affairs and was held in high esteem by everyone who knew him, particularly by his patients and professional brethren. He was constant in his attendance at medical meetings and could always be relied on to give a sound opinion, expressed in a clear and definite manner. He was recognized as one whose views on medico-political matters were most valuable. When the National Health Insurance Act came into being Linnell was the inevitable choice as representative of his district, and he became one of the first members of the Insurance Acts Committee. Here his talents were properly valued, and when regional medical officers were first appointed he was among the chosen. No one was more suitable. He had a wide knowledge of medical practice and of human nature, which enabled him to hold a fair balance when there were differences between his Department and medical practitioners. It is a tribute to the democratic ways of our Association that a man who started his professional work in a village practice could attain to the position he held—not only his official position but the place he held in the hearts of his fellow-practitioners.

Dr. DAVID ROBERTSON TAYLOR died on November 8 at his residence in Malone Road, Belfast. He was educated at the University of Edinburgh and Queen's University, Belfast, graduating M.B., Ch.B.Ed. in 1906 and taking the Belfast D.P.H. in 1918. He had held the posts of house-surgeon at the Royal Victoria and the Maternity Hospitals at Belfast. Dr. Taylor was a member of the British Medical Association and the Ulster Medical Society. He was an old-established general practitioner of the classical type, and during the present war was constantly engaged on medical boards. He was an outstanding athlete and represented Ireland at rugby football as a centre three-quarter in 1903. In more recent years cricket commanded his attention, and he represented the Province of Ulster on many occasions.

Dr. PETER MURRAY KERR died on November 16 at Dumfries at the age of 78. He was one of the best-known doctors in the south of Scotland, where he had practised for nearly half a century. He took the M.B., C.M. at Edinburgh University in 1887, and not long after graduation settled in Dumfries, where he served for many years as surgeon to the Dumfries and Galloway Royal Infirmary. Dr. Kerr joined the British Medical Association in 1892, represented the Dumfries Division at the Annual Meeting of 1908, and held office as chairman in 1925-6; in the following year he was elected president of the Border Counties Branch. In his early years of practice he had been medical officer to the old Dumfries Parish Council: later he served for twenty years as medical referee for Dumfriesshire under the Workmen's Compensation Act and for the Ministry of Pensions. He joined the 3rd King's Own Scottish Borderers in 1891, and was gazetted to the command of the 5th Battalion in 1911. He went with his regiment to Gallipoli in 1915 with the rank of lieutenant-colonel, but was invalided home. After the last war he maintained his keen interest in the regiment as its honorary colonel, and received the Territorial Decoration. In 1930 his services to the local hospital and to the community of Dumfries and district were publicly recognized. In recent years he had been an honorary Sheriff-Substitute, and also a J.P. for the county.

The following well-known medical men have recently died abroad: Dr. DEAN DE WITT LEWIS, president of the American Medical Association, 1933-4, editor from its foundation of the *System of Practice of Surgery* and of the *International Surgical Digest*, and editor of the *Archives of Surgery* since 1921; and Dr. FRANK BURR MALLORY, formerly professor of pathology at the Harvard Medical School, Boston, editor of the *American Journal of Pathology*, and co-editor with J. Homer Wright of *Pathological Technique*.

Medico-Legal

A FATHER'S DILEMMA

Refusal to allow Amputation

A labourer of Glamorgan, an ex-soldier with six children, was tried recently at the local quarter sessions for neglecting one of his sons, aged 6 years, by failing to provide him with adequate medical attention. The evidence for the prosecution was chiefly medical and was not substantially in dispute. The boy was suffering from tuberculosis of the left knee. He had been in the special hospital at Glan Ely for fourteen months and had been discharged able to walk. In April of this year, however, he was readmitted; his condition was steadily getting worse and he was beginning to suffer from chronic general poisoning. The medical men in charge of the boy advised the father that the only hope for the boy's life was to amputate the leg, and that even this, in view of his bad general condition, would be a dangerous operation. The father refused his consent, and the prosecution followed. Council for the defence said on the father's behalf that he had not been told his son's life was in danger and that he had not finally, but only provisionally, refused consent. The man himself said he was afraid the shock of the operation would kill his son; that during his service through the last war he had seen a great many fatal amputations; and that if he thought the child would recover he would consent at once, though even so the child would be a cripple for life. The jury acquitted him after only two minutes' deliberation in open court.

Considering that the prosecution admitted a substantial risk that the amputation might not save the boy's life, it is a little difficult to see why the authorities should have seen fit to add to the father's existing distress and anxiety by prosecuting him. Medical attention is a "necessary" for the provision of which a minor may make a valid contract; and which the parent or guardian of a minor is bound by law to provide. This obligation has probably always existed at common law, but has been specifically enacted in a number of statutes relating to the welfare of minors. The law at present in force is contained in Section 1 of the Children and Young Persons Act, 1933. It is a criminal offence to neglect a child under 16 in a manner likely to cause him unnecessary suffering or injury to health, including injury to or loss of sight, hearing, a limb, or an organ of the body. A parent or guardian is deemed to have neglected a young person under this section if he has failed to provide adequate medical aid for him, or failed to take steps to procure it to be provided under the Acts relating to the relief of the poor.

Did the Parent Act Reasonably?

The present case is amply covered by authority. In Oakey *v.* Jackson[1] a girl of 13 had been suffering from adenoids, which were injuring her health. The only possible remedy was a surgical operation. This was not a dangerous operation, but the father refused his consent to it. He was summoned for wilfully neglecting her in a manner likely to cause injury to health, by failing to provide adequate medical aid (the Children's Act, 1908, contained the same provisions as the 1933 Act). The justices dismissed the information on the ground that the father was under no legal liability to consent to the operation. Mr. Justice Darling said on appeal that in such cases, as in so many other branches of law, the test must be whether or not the parent has acted reasonably. There may, he said, be cases in which a parent is bound to allow his child to undergo an operation, but a refusal to allow an operation is not necessarily a failure to provide adequate medical aid of a kind which offends against the statute. The question can be answered only by considering all the evidence in each case; it is one of fact. The justices who are called upon to reach such a decision must take into consideration the nature of the operation and the reasonableness of the parents in refusing to permit it. Mr. Justice Avery added that another material fact is whether the operation is advised by a qualified medical practitioner or merely by some irresponsible person. In the case against the Glamorgan father the chairman of the sessions, following this decision, put to the jury the

[1] 1914, 1 K.B. 216.

simple question: Was the father's refusal reasonable in all the circumstances? and the jury had little hesitation in finding that it was.

A correspondent has asked whether in such a case a court has power to order a given operation to be performed. The answer seems to be clearly laid down in the 1933 Act, Section 63. If the jury acquits, the court of course takes no notice of the order, but if the parent is convicted the court may make an order committing the child to the care of a "fit person." Often the fit person is the local authority, and under the order it has the powers of a guardian to give consent to the indicated operation. Alternatively, the court may bind the parent over to exercise proper care and guardianship, and this would presumably include his consent to the operation.

The Services

NAVAL AWARDS

The D.S.C. has been awarded to Temporary Surgeon Lieuts. Emlyn Roderick Llewellyn Davies (H.M.S. *Manchester*), Cyril Joseph Vaughan (H.M.S. *Forester*), and Eric John Yates (H.M.S. *Fearless*) for courage and resolution in operations in Mediterranean waters.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

War Substantive Captain ERNEST JOHN FRANK HINDE, who was announced as "Missing at Sea" in the *Journal* of November 1 (p. 638) and who is now reported to have died at sea in August as the result of enemy action, was the eldest son of Dr. and Mrs. E. B. Hinde of Norwich and qualified M.R.C.S., L.R.C.P. in 1938. In October, 1939, he was granted a temporary commission as lieutenant in the R.A.M.C., and was promoted captain a year later. He was a member of the British Medical Association. He leaves a widow.

Missing

Lieut. Niall Eugene O'Neill (*not* prisoner of war, as announced in the *Journal* of November 16, p. 689).

Prisoner of War

Lieut. John Edward Readman.

Universities and Colleges

UNIVERSITY OF EDINBURGH

At a meeting of the University Court, held on November 17, with Sir J. Donald Pollock, Rector, in the chair, it was reported that Dr. H. M. Traquair had been appointed a member of the Court as a General Council Assessor in succession to Sir Norman Walker.

On the recommendation of the Senatus and the Faculty of Medicine, the Court approved the appointment of Prof. Bruno Nowakowski, professor of hygiene, as a member of the Faculty of the Polish School of Medicine in Edinburgh.

It was announced that a bequest had been received from the late Mrs. M'Laren of Stirling of £2,000 in memory of her husband, Lawrence M'Laren, the interest to be used for research in the cause and cure of brain and nerve trouble and to be called the Lawrence M'Laren Bequest.

EXAMINATION FOR CZECH MEDICAL DEGREES

At the request of the Czechoslovak Minister of the Interior and Education in London, the Examining Board in England of the Royal Colleges of Physicians and Surgeons has undertaken to conduct a special Final Examination (Second and Third Rigorosa) for the Czechoslovak MUDr. degrees. Part I (Pathology and Bacteriology) was conducted in London last week, when twelve candidates were examined, of whom the following satisfied the examiners: Artur Flach, Jan Glaser, Zdenek Pfeifer, Karel Skopek, Karel Josef Susat, Walter Tausig, Josef Voracek, and Josefina Liebsteinova.

Medical Notes in Parliament

Health and Disease in the Colonies

Mr. NOEL BAKER opened, on November 20, a debate on colonial affairs. He said Parliament was now building up the social services of the Colonies, but there was still too much poverty and preventable disease. Mr. DE ROTHSCHILD said that under the Colonial Development Act the production of subsistence crops should be encouraged. There was much chronic ill-health among the natives due to a diet of low nutritive value. Unless a deficiency of sound home-grown food was remedied the work of doctors, nurses, and hospitals stood little chance of success.

Dr. MORGAN said the people of the West Indies suffered from malnutrition because the ground was used for exportable crops. There were in the West Indies instances of a chief medical officer acting on a basis of favouritism and of crowds of doctors moved without cause to the poorest parishes. He found the people of the West Indies living in a cesspool of disease—yaws, hookworm disease, syphilis, malaria, tuberculosis, infectious diseases, leprosy. Tuberculosis in the West Indies was of a galloping type, and in certain places syphilis affected 60% of the population. Hookworm disease spread because the Government would not insist on preventive measures. The doctors were blamed for a medical policy with which they had nothing to do. He had never seen a more disgraceful hospital than at San Fernando in Trinidad.

Mr. GEORGE HALL replied to the debate, but did not deal in detail with Dr. Morgan's charges.

High-frequency Apparatus

On November 27 Mr. HERBERT MORRISON told Dr. Howitt that for security considerations he could not instruct the chief officers of police to report on the possibility of licensing the use of more short-wave high-frequency apparatus, such apparatus being completely screened and issued only to practitioners for whose integrity the police could vouch. This proposal, he added, had been considered before the Control of High-frequency Apparatus Order was made. Dr. HOWITT asked whether a test had been made of how far these rays travelled. Mr. MORRISON replied that he could not say. It was undesirable to discuss such details in public.

Diphtheria Immunization.—On November 18 Mr. VIANT asked the Minister of Health whether he would obtain information of the amount of immunization against diphtheria practised in the areas covered by his circular dated June 12, 1941, in view of the fact that unless this information was given the mere number of cases of diphtheria notified and the proportion of cases immunized would not have any significance. Mr. ERNEST BROWN replied that the main purpose of the returns referred to in the circular was to furnish information about the extent to which immunization of children against diphtheria was carried out between January 1, 1940, and September 30, 1941. The return had been asked for from all local authorities.

Disease in Wiltshire Labour Camps.—Sir PERCY HURD inquired on November 20 what action Mr. Brown had taken upon the report last month by the Wiltshire Public Health Committee that the committee had been called upon to provide facilities for cases of vermin, scabies, venereal disease, and advanced pulmonary tuberculosis among imported labourers, especially from Ireland, for employment on Government contracts. Mr BROWN reported local consultations with all concerned regarding medical arrangements at the labour camps referred to. The county council's medical officer was giving valuable assistance, and the necessary measures were in train.

Sir PERCY asked whether steps would be taken to ensure a strict medical examination before importation of labour. Mr. BROWN said that point was being considered in conjunction with the Ministry of Labour and National Service.

Compensation for Shock.—Sir WALTER WOMERSLEY said on November 20 that his attention had not been drawn to a decision given in the Bristol County Court that injury under the Personal Injuries Scheme did not include shock unless accompanied by physical injury. He added that compensation was payable where, as a result of enemy action, a person sustained concussion of the brain, whether there was visible injury or not, or where a person sustained nervous shock of a commotional character associated with blast, burial among debris, or some similar severe incident. In either case the patient must be medically certified as incapable of work.

Incidence of Tuberculosis among Young Women.—On November 20 Mr. BROWN told Mr. J. Griffiths that in 1940 mortality among women from all forms of tuberculosis showed an increase of 11% over the figure for 1939. The highest incidence was in the age group 20-24, where the increase was 18%. He had arranged, with the co-operation of the Medical Research Council, for expert investigation of the possible causes of the increase. Everything possible was being done to maintain the tuberculosis service.

Insurance Practitioners: War Bonus.—On November 25 Mr. ERNEST BROWN said that he had received copies of resolutions recently passed by the Doncaster and Kent Panel Committees supporting the appeal for a war bonus of 4s. to insurance practitioners. He could not see his way to grant such a bonus.

Mr. GROVES asked whether the Minister was aware of the difficulties of the average medical practitioner to meet the increased income tax out of a capitation fee which, despite its rise, really remained as it was at the end of the last war, and whether he would consider granting a war bonus. Mr. BROWN: I am not aware of any reason why medical practitioners should not be subject to income tax in the same way as other citizens. The capitation fee is to be increased for other reasons from the beginning of next year, and I am not prepared to increase it further by way of compensation for the increase in income tax.

Pediculosis, etc., in Evacuated Children.—On November 25 the Minister of Health was asked whether he was aware that the condition of evacuated children from London showed pediculosis, impetigo, and scabies, and why such children were permitted to change their residence. Mr. BROWN said he was aware that in the past children suffering from these conditions had sometimes arrived in the reception areas. It had recently again been thoroughly impressed on the evacuation authorities in the London area that before organized parties of children were sent to reception areas medical inspection must be carried out and, where necessary, the children must receive efficient treatment before they might travel. The authorities knew that no child who was suffering from an infectious condition must be sent out until he was cured.

Courses for R.A.M.C. Officers.—On November 25 Captain MARGESSON, replying to Mr. Thorne, referred to courses given to civilian doctors on entering the Army Medical Service. He said that some 5,000 medical officers had passed through a course at the Army School of Hygiene, and over 1,000 through a course for the treatment of mechanical warfare casualties.

Notes in Brief

On November 25 Captain Margesson told Mr. Leach that no cases of small-pox in the Army had been reported since the outbreak of war.

Major Lloyd George states that, provided they are stored under suitable conditions, canned foods such as are now being distributed remain sound indefinitely.

Major Lloyd George stated in reply to Captain Profumo that no recommendation made by the Medical Research Council with regard to national wheatmeal bread had been rejected by Lord Woolton. All had been acted upon, with one exception. That is still being examined.

The November issue of *Industrial Welfare and Personnel Management*, the journal of the Industrial Welfare Society, includes an article on Factory War Casualties by Dr. H. A. Faulkner, who describes the need for "a carefully planned bomb-proof organization to deal with the results of incidents," and outlines the principles on which the scheme in his firm is run: competent area first-aid organizations under efficient incident officers; central mobile units of well-trained first-aiders for use in any part of the works; a well-equipped casualty clearing station (with equipment for comfort of patients as well as medical and surgical treatment), and one or more reserve casualty clearing stations. An editorial discusses means for controlling influenza and the common cold, which are responsible in normal times for between 30% and 40% of the working hours lost in industry. Firms are trying various methods in the hope of reducing this loss: free inoculation of employees, sun-ray treatment, distribution of vitamin capsules, reduction of overcrowding, encouragement of the use of face-masks, spraying the air with disinfectant, education in general hygiene by works doctors and nurses. A letter from Dr. T. E. A. Stowell, chairman of the Industrial Welfare Society's advisory medical committee, points out the dangers of unsupervised use of artificial sunlight treatment, but emphasizes the value of correct exposure in preserving health, promoting a sense of well-being, reducing fatigue, and increasing resistance to disease.

SURVEY OF LONDON HOSPITALS

In the House of Commons on Tuesday Captain G. S. Elliston asked the Minister of Health whether he was in a position to make any further statement about the survey of hospitals in London and the surrounding area proposed in connexion with the Government's post-war hospital policy. Mr. Ernest Brown, in reply, gave the following as the terms of reference for the guidance of those undertaking the inquiry:

> "To survey the hospitals (other than mental hospitals and mental deficiency institutions) in London and the surrounding area; and having regard to the information thus obtained and to the general principles of post-war hospital policy laid down by the Minister of Health in the House of Commons on October 9, to advise the Minister what area would appropriately be served by a hospital system centred on London, and what modifications or extensions of the existing hospital facilities would be necessary or desirable to give effect to that policy."

The Minister added that he had invited Dr. A. M. H. Gray, President of the Royal Society of Medicine, and Dr. Andrew Topping, Deputy Medical Officer of Health and School Medical Officer for the County of London, to act as surveying officers, and both had accepted the invitation. The services of Dr. Topping had been made available through the kind offices of the London County Council. A beginning had already been made with the preliminary work of the survey.

While it happens that one of the "surveyors" is associated with the voluntary hospitals and the other with the municipal, it is understood that they have not been chosen as representatives of these two aspects, but merely as persons who have had large experience in separate fields of hospital administration. The business of Dr. Gray and Dr. Topping will be to advise as to how hospitals can give the best service to the public; we understand that the whole question of teaching would be considered separately.

Medical News

At a meeting of the Pharmaceutical Society of Great Britain on Thursday next, December 11, at 2.30 p.m., in the Society's house, 17, Bloomsbury Square, W.C., the Harrison Medal will be presented to Mr. Thomas Tickle, B.Sc., public analyst for the County of Devon, and a member of the British Pharmacopoeia Commission. After the presentation Mr. Tickle will deliver the Harrison Memorial Lecture on "The Influence of Analytical Chemistry on Pharmacy." In this he will give the impressions of one who was first trained as a pharmacist and who afterwards practised as an analyst for forty years in close association with pharmaceutical matters. It is hoped that members will bring friends. Tea will be served after the meeting.

Colonel T. E. Osmond will deliver a lecture on "Venereal Disease in the Army: its Prevalence, Prevention, and Management," at the Weston Hotel, Bath, on Thursday, December 11, at 5.30 p.m. All Service medical officers and civilian practitioners will be welcome.

Mr. Ernest Brown, Minister of Health, will address a meeting on December 10 at the Royal Institution, Albemarle Street, under the auspices of the National Council for Maternity and Child Welfare. His subject will be "The Care of Mother and Child in Wartime." The other speakers will be Miss Crosbie and Professor Fletcher Shaw. Lord Dawson of Penn will preside. Dr. Allen Daley, Chief Medical Officer of the L.C.C., will propose, and Dame Louise McIlroy will second, the vote of thanks.

A Dominions and Colonies Section meeting of the Royal Society of Arts will be held at John Adam Street, Adelphi, London, W.C., on Tuesday, December 16, at 1.45 p.m., when Dr. Maurice Ashby will read a paper on "British Empire Drug Production."

Owing to the efforts of the Nazis to secure medical aid for the war wounded in Slovakia, cars have been sent to the Jewish internment camps and forced labour battalions not only for Jewish doctors but also for male nurses and medical students.

The Minister of Health announces that the Medical Research Council has tested samples of pituitary extracts carrying the expiry date October 26, 1941, and has reported that provided supplies of these extracts have been kept under ordinary conditions of storage and at normal room temperatures they may be used with safety for a further twelve months.

The well-known firm of manufacturing chemists in the United States, John Wyeth and Brother, Inc., of Philadelphia, recently restored the old necropsy house of the Philadelphia Hospital at Old Blockley, and dedicated it to the memory of Sir William Osler. In the June issue of the *Bulletin of the History of Medicine* there are fifty pages to commemorate the dedication of the Osler Memorial Building. This interesting and profusely illustrated section includes a number of signed articles bearing upon Osler's life, with special reference to his years at Philadelphia as professor of clinical medicine in the University of Pennsylvania.

The September issue of the *Journal of Pediatrics* is devoted to the problems of adolescence.

EPIDEMIOLOGICAL NOTES

Discussion of Table

An increase in the notifications of pneumonia, dysentery, and whooping-cough occurred during the week in England and Wales, the notifications of the other infectious diseases being below the totals of the preceding week. The large rise in the incidence of pneumonia—266 cases—was distributed throughout the country.

A further 65 cases of measles were notified in the epidemics which began during the previous week in Kent, Eastry R.D., with 94 cases, and an outbreak of 20 cases in Malling R.D. was also reported from that county. Four of the 21 cases of poliomyelitis were recorded in Buckinghamshire: that county is again the principal centre of infection, a position it occupied three months ago, when the incidence of this disease started to rise.

In Scotland a fall in the number of notifications of diphtheria, measles, and dysentery was recorded, while the figures for scarlet fever, whooping-cough, and pneumonia were in excess of the totals of the preceding week.

In Eire the notifications of diphtheria, measles, and whooping-cough were twice as numerous as in the previous week. Whooping-cough was practically confined to one area—Westport R.D., Co. Mayo, where 49 of the 57 cases were notified. The largest rises in the figures for the other two diseases were recorded in Dublin.

Diphtheria

The number of cases of diphtheria notified in England and Wales was 26 fewer than in the preceding week. During the past two months the weekly total of notifications has alternately risen and fallen, and there has been no obvious tendency towards an increased or decreased incidence for the country as a whole. The trend of the notifications in the various divisions of the country has, however, not been uniform, and some interesting contrasts are displayed when the subdivisions are considered. In Wales there has been a 50% increase during the past three months; in the north-western counties the increase has been of the order of 25%, while in the south-western counties the incidence has declined by 50% during this period.

Dysentery

Notifications of dysentery in England and Wales increased by 56 during the week compared with the total of the preceding week. The largest of the local outbreaks was reported from the administrative areas of Surrey (Coulsdon and Purley U.D. 19, Dorking and Horley R.D. 12), Dorset (Dorchester R.D. 10), Derbyshire (Derby C.B. 22), and Lancashire (Blackburn R.D. 19).

Returns for the Week Ending November 22

The returns of infectious diseases notified during the week included scarlet fever 1,417, whooping-cough 1,995, diphtheria 1,082, measles 639, pneumonia 1,100, cerebrospinal fever 114, poliomyelitis 13, dysentery 209, paratyphoid 18, typhoid 10. Deaths from influenza numbered 25.

No. 46

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland. A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	104	5	28	—	6	129	13	32	1	7
Deaths		1	1				3	3		
Diphtheria	1,043	34	262	58	37	1,408	30	457	12	36
Deaths	43	1	6	1	—	52	3	5	4	5
Dysentery	204	12	45	—	—	97	—	31	2	—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	5	—	1	—	—	4	—	2	—	—
Deaths		—	—				2	1		
Enteric (typhoid and paratyphoid) fever						22	1	7	2	—
Deaths						4	—	1	—	—
Erysipelas		—	60	9	6		16	58	5	7
Deaths		1	—				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	37	3	19	19	7	28	3	14	4	3
Measles	671	50	19	61	4	13,114	190	486	—	24
Deaths	2	—	—	—	—	20	—	2	1	—
Ophthalmia neonatorum	78	1	11	2	—	72	4	21	—	—
Deaths										
Paratyphoid fever	30	5	—	—						
Deaths	—	—	—	—						
Pneumonia, influenzal*	997	44	14	4	5	698	26	6	—	6
Deaths (from influenza)	38		5	2	—	33	3	2	3	1
Pneumonia, primary		33	226	17				207	6	
Deaths				9	11		38		12	2
Polio-encephalitis, acute	1	—				5	—			
Deaths		—					—			
Poliomyelitis, acute	21	—	1	6	—	22	—	4	1	—
Deaths		—	—				—	—		
Puerperal fever	1	1	15	4	—	—	—	4	3	—
Deaths		—					—			
Puerperal pyrexia	135	4	10		4	128	2	8		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,352	36	247	59	44	1,684	53	268	74	51
Deaths	—	—	—	2	—	1	—	—	1	—
Small-pox	—	—	—		—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Typhoid fever†	9	—	1	7	2					
Deaths		—								
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	2,066	177	88	57	5	2,032	15	188	—	12
Deaths	8	2	3	—	—	10	1	3	—	1
Deaths (0–1 year)	338	23	80	40	23	280	16	77	22	22
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,473	618	647	192	137	5,490	1,201	630	168	130
Annual death rate (per 1,000 persons living)			14·1	12·7	‡			12·7	11·2	11·4
Live births	4,937	410	770	306	215	4,627	378	763	298	147
Annual rate per 1,000 persons living			15·7	20·3	‡			15·4	19·9	12·0
Stillbirths	195	22	34			185	14	46		
Rate per 1,000 total births (including stillborn)			42					57		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.
† Includes paratyphoid A and B for Northern Ireland.
‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Aitiology Westcent, London*; SECRETARY, *Medisecra Westcent, London*.

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Stabbing Heel Pains in Rheumatoid Arthritis

Dr. E. S. HART writes from Great Yarmouth in reply to W. R. S., whose query appeared on November 15 (p. 716): Has the patient tried raising the bedclothes with a stool?

Gum of Postage Stamps as Germ Carrier

Mr. A. ERNEST SAWDAY, F.R.C.S.Ed. (London, N.8), writes: For the greater part of my life I have collected stamps. This hobby is very popular among medical men. If this note should catch the eye of a philatelic bacteriologist his observations as to the possibility of tubercle bacilli (and other organisms) being carried alive in the gum of postage stamps would be of interest.

Students Seeking Midwifery Cases

PAUL A. RIDDLE, GORDON D. MCDONALD, and DIXIE M. CLEMENT write from the Edinburgh University Union: We are three fourth-year medical students of Edinburgh University at present attending midwifery lectures. We would like to do our twelve practical midwifery cases from the same hospital during our Easter vacation (March 19 to April 14). We would be very grateful if any of your readers could put us in touch with any hospital or institution which would be willing to take us, together with details of cost, etc.

Income Tax

General Practice and Appointments

J. O. is in general practice and also holds two or three appointments, for one of which—part-time M.O. at a factory—he receives £450 per annum. Must the emoluments from these appointments be assessed under Schedule E?

*** Strictly such emoluments are so assessable, but it is the general and accepted practice of the Inland Revenue Department to include them in the general receipts of the practice where the duties are of the ordinary professional type. That condition seems to be met in J. O.'s case, and we think that his request for assessment under Schedule D only is in accordance with general custom. If the local inspector of taxes does not agree we suggest that the facts be put before the Chief Inspector of Taxes, Somerset House, London, W.C.2.

LETTERS, NOTES, ETC.

Control of Scabies

Dr. W. F. COOPER writes: There have been letters which, very rightly, emphasize that a proof of cure is difficult. I wrote (April 19, p. 616) stating from personal experience that sulphur alone (and it is necessary to emphasize that it is mixed with nothing whatever) was efficacious. When I was abroad a friend who was staying with a neighbour some five miles off came to me suffering from itch. In a few days I also was infected. I treated this man and myself by dusting powdered sulphur into our clothes, into the rugs (no sheets), and all over the joints of the iron bedstead. I used the same clothes every day, partly because we had only one or two spares, partly because I knew that it would not matter. I had a bath at night as usual, and changed into pyjamas, which were also thoroughly dusted with sulphur. In a country where one gets very hot there is no possible doubt whether one is itching, and so a cure of "itching" can be quite certain. After a few days of this powdered sulphur treatment there was no more itching; so if the acarus remained it had lost all power of causing trouble. There was no return of it over a period of several months. It is well known that sulphur is one of the most effective remedies against pests, and has been used for centuries. Many thousands of tons of it are used annually in ether parts of the world against both insect pests and fungous diseases. The most usual form is as calcium polysulphide, which is a solution of sulphur in calcium hydrate. On exposure to air this forms chalk and the sulphur is precipitated. If the shelters were sprayed out with this solution (diluted) there would be no infestation of the places by "itch," and infectious diseases should be reduced.

The Future of Mental Health

Dr. F. DUDLEY (Newton Abbot) writes: I have read with interest and appreciation Dr. A. J. Brock's comments (November 15, p. 710) on Dr. Karin Stephen's article which appeared in your issue of October 25 (p. 589). The difficulty is to find the "mentally healthy *milieu*" in which to treat suitable cases. There are psychoneurotics who, when admitted to a mental hospital, at once begin to improve. Mental disability is, if possible, even more widespread than physical disability, and, like it, is a matter of degree. Reason and emotion are more often than not incompatible. There is more unreason outside the mental hospitals than in the wards. The certified patients are those who, because of their disability, are incapable of looking after themselves or managing their affairs, and whose friends are unable or unwilling to do so. There are mentally unbalanced dominant personalities whose conduct makes the lives of relations and friends a misery, but the latter, for family or other reasons, will not have them "put away."

Treatment of Burns and Wounds by the Envelope Method

Dr. D. O'DWYER (Plaistow, E.13) writes: I was surprised to read in the letter of Mr. A. G. F. Halford (November 22, p. 750) certain criticisms of the envelope treatment for burns. In his reference to Lister there was the following statement: "He contended that antiseptics, however mild, interfered with healing. . . ." Is it presumptuous to suggest that if the great man were alive to-day he might be prepared to qualify this statement? With regard to eusol, my experience over a period of twenty-five years has been the reverse of this contention. Whatever the faults of this antiseptic may be, I don't think that anyone would maintain to-day that it interferes with the healing of wounds. The beauty of the envelope technique is that it minimizes any objectionable features in the hypochlorite solution, while utilizing to the full its healing and antiseptic properties. It has been made clear that the action of electrolytic sodium hypochlorite is not so much in killing germs as in removing necrotic tissues.

Malaria illustrated by Cinematograph Film

Dr. P. A. STEVEN (Ripon) writes: I was interested to read in the *Journal* of November 15 (p. 707) of a film on malaria, and trust some day the profession may have a chance of seeing it. I see the idea is a world-wide production. The description is thrilling, and to those of us who in the late war served in malarial districts is of special interest. I trust we in time may have the pleasure of seeing the production.

Clothing Coupons for the Expected Child

Dr. N. KEMP (York) writes: I suggest that an effort should be made to secure an alteration in the regulations for the supply of coupons to the expectant mother for the necessary clothing for the expected child. The supply appears to be quite inadequate. One of the principal grievances is that for each napkin made of Turkish towelling one coupon is required. An experienced maternity home matron, who can look back upon a long succession of patients to whom she has been in the habit of giving detailed advice about the equipment of the infant, tells me that thirty-six napkins are necessary. Thus, straight away thirty-six coupons have to go. It is true that for the various kinds of muslin squares no coupons at all are asked. They, however, are more expensive and much less "thrifty," being less able to stand the perpetual washing required. Fourteen coupons are left, therefore, for the other items of clothing, and the child requires at least two of each garment, and should have three. It is difficult to see how the child can be fitted out with fewer than sixty coupons, especially in the case of the less well-to-do. If the infant is not the first arrival in the family, no doubt the time-honoured custom of the younger members wearing the cast-off clothing of the older ones is a help. Further, apparently in some areas these coupons are not to be given before the sixth month of pregnancy. This leaves much work to be done by the expectant mother at a time when she might be glad to think that her preparations were nearly completed. A further strange direction in some of these cases is that the expectant mother is called upon to attend at an office at some considerable distance from where she lives in order to procure the coupons, and this at the sixth month of pregnancy, and in these times when travelling any distance is not encouraged.